

**WY-99GT**  
**User's**  
**Guide**

**WYSE**

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# Overview

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## Introduction

In addition to advanced display, communications, and keyboard features, this terminal supports a variety of personalities for ANSI X3.64 (DEC VT220/100), ASCII (WT-99GT, WY-50/50+, HZ1500, and the TeleVideo family), PC Terminal, and graphics (including Tektronix and PC Graphics modes).

Chapters 1 through 4 present the basic information you'll need to install and operate the terminal in its native mode. The appendixes include a complete list of commands supported by the terminal in all modes.

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## Conventions

The term *native mode* refers to the terminal's normal operating mode. The term *personality* refers to operating modes characteristic of one or more other terminals.

Key functions are described in the text as follows:

- The symbol for the key on the WY-99GT VT220-style keyboard is shown first, followed by key symbols in parentheses for the other keyboards if they are different. For example,

**Setup** ( **Shift** **Setup**, **Shift** **Select** )

identifies **Setup** on the WY-99GT VT220-style keyboard, **Shift** **Setup** on the ASCII keyboard and **Shift** **Select** on the Enhanced PC-style keyboard.

- When a key symbol in the text refers to one of two names on a key on the keyboard, the action of other keys may be implied. For example, **Print** assumes the simultaneous pressing of **Shift** on the ASCII keyboard, where **Send** would mean the same key by itself (unshifted).
- The italic *kpd* identifies keys on the numeric keypad.



# 1

# Installing the Terminal

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## Getting Ready

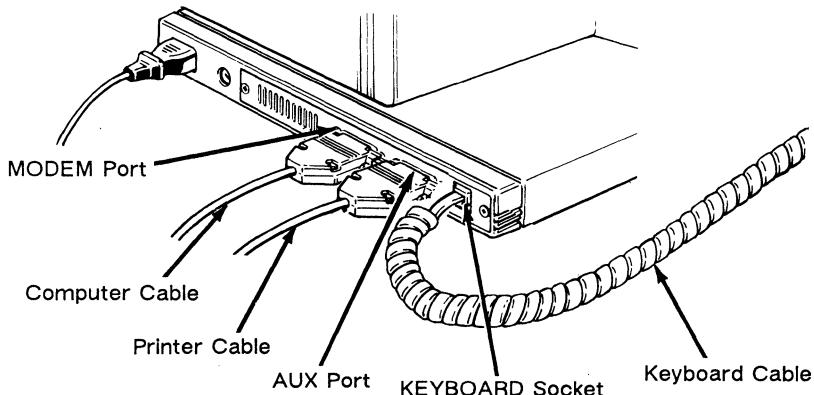
You'll need a shielded serial interface cable (fitted with a female 25-pin connector on the terminal end) to connect the terminal to your computer or modem. If you plan to connect a serial printer directly to the terminal, you'll need a second serial cable with a male connector. (See Appendix A for connector pin assignments.)

Place the terminal on a flat, hard surface, allowing three inches on all sides for ventilation.

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## Connecting the Terminal

- 1 Press the bottom half of the power switch on the right side of the terminal base to be sure that the terminal is turned off.
  - 2 Plug the keyboard cable into the socket labeled KEYBOARD on the left rear of the terminal.
- 



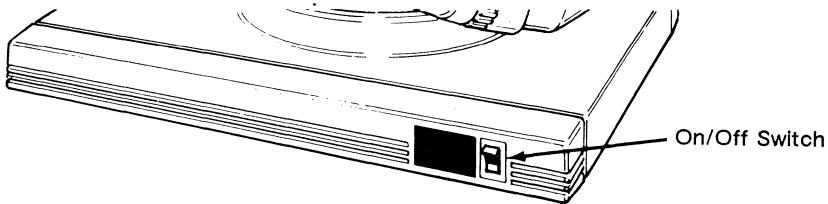
- 3 Connect the computer cable to the MODEM port and the printer cable to the AUX port.
  - 4 Plug the power cord into the terminal's power connector and into a three-pronged grounded power outlet. (If you use an adapter, be sure to ground the outlet.)
- Note** Make sure your building's voltage (120 in the U.S.) matches the voltage shown on the back of the terminal.

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#### Turning On the Terminal

Press the top half of the power switch to turn on the terminal. You'll hear an immediate beep if the terminal has received power.

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- 
- Note** If the bell sounds and an A, B, C, D, E, F, G, K, W, X, Y, 6, or 7 appears at the bottom of the screen, press **Setup** (**Select**) to exit the self-test. If the error codes 0, 1, 9, p, or P appear, call your service representative—the terminal needs to be serviced by a qualified technician.
- 

#### Adjusting the Terminal

Adjust the screen's brightness with the dial in the right front corner. If you want the keyboard slanted up slightly, turn it over and unfold the hinged foot.

# 2

# Configuring the Terminal

This chapter tells how to configure the terminal's operating parameters and redefine the programmable keys in setup mode.

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## Entering and Leaving Setup Mode

To enter setup mode, press **Setup** (**Shift** **Setup**, **Shift** **Select**), or, on the VT220-style keyboard when the terminal is in PC terminal or PC graphics personalities, press **Select**). Data on the screen disappears, and the *top setup level* screen appears; the data is restored when the terminal returns to normal operating mode.

■ **Caution** Don't enter setup mode while data is being transmitted. The terminal can't receive data from the computer in setup mode.

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## Top Setup Level

EXIT	SAVE MODES	SAVE ALL	DEFAULT ALL	RESTORE ALL
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TO EXIT SETUP USE ARROWS AND F10	TO CHANGE PARAMETERS USE F1-F9
----------------------------------	--------------------------------

F1 DISP	F2 GENERAL	F3 KEYBRD	F4 COMM	F5 MISC1	F6 MISC2	F7 TABS	F8 F/KEYS	F9 A/BACK	F10 EXIT
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The top level serves as a directory to the other setup levels and to the alternatives for leaving setup mode.

- The fields at the bottom of the screen name the various setup levels where you can change the terminal's operating parameters.

- The fields at the top of the screen show the options for saving or not saving changes in nonvolatile memory when you return the terminal to the normal operating mode.
- The second line identifies the keys that you press to select the fields and activate their functions.

Press the cursor keys to highlight one of the fields at the top of the screen and press **[F10]**. Table 2-1 explains the function of each field.

Table 2-1 Top Level Functions

Field	Function
EXIT	Returns terminal to normal operating mode without saving parameter changes for power up.
SAVE MODES	Saves operating parameter changes only and returns terminal to normal operating mode.
SAVE ALL	Saves all changes (operating parameters, tabs, key definitions, and answerback message); returns terminal to normal operating mode.
DEFAULT ALL	Restores all settings (operating parameters, tabs, key definitions, and answerback message) to default values and highlights EXIT field. Default values are <i>not</i> saved unless you select the SAVE ALL option to exit setup mode.
RESTORE ALL	Restores all settings and definitions to values last saved in nonvolatile memory and highlights the EXIT field.

**Changing the Operating Parameters**

To select one of the setup levels named on the bottom line, press the indicated function key.

- The screen for that level appears with the name highlighted.
- The fields in the middle of the screen indicate the current settings for parameters you can change in that level.
- The top line identifies the keys you press to highlight the parameter fields and change the settings. Pressing **[F10]** always returns you to the top level.

The following tables list the parameters for each level and explain their settings. Default settings are listed first unless otherwise noted.

- Note** Explanations of setup parameters apply to the terminal's native mode. If you select a parameter setting that's invalid for the current personality, the terminal defaults to a valid setting upon leaving setup mode.

**Table 2-2 F1 DISP: Display Setup Parameters**

Parameter	Explanation
AUTOSCROLL ON OFF	When the cursor moves past the last line of the page, The data scrolls up one line It returns to the top of the same page
ATTRIBUTE CHAR LINE PAGE	Display attributes are Assigned to each character as it is entered Active to the end of the line Active to the end of the page
BACKGROUND DARK LIGHT	The screen displays Light characters on a dark background Dark characters on a light background
CELL SIZE* 10 X 10 10 X 13	The character cell size is Ten scan lines high Thirteen scan lines high
COLUMNS 80 132	The screen displays 80 columns 132 columns
CURSOR BLINK BLOCK STEADY BLOCK BLINK LINE STEADY LINE	The cursor display is a Blinking rectangle Steady rectangle Blinking underline Steady underline
DISPLAY CURSOR ON OFF	The cursor is Visible Invisible
END OF LINE WRAP ON OFF	When additional characters are entered at the end of a line, The cursor wraps to the start of the next line Characters at the cursor position are replaced
LINES 24 25 48 50	The screen displays 24 data lines, top status line, and label line 25 data lines and top status line 48 data lines, top status line, and label line 50 data lines and top status line

\* If you change the cell size parameter and the FONT LOAD setup parameter is ON, the screen will be blank for a few seconds when you leave setup while the font is loading.

Table 2-2 Continued

Parameter	Explanation
SCROLL SPEED	The display scrolls
JUMP	At the rate data is received
SMOOTH-8	Eight lines per second
SMOOTH-4	Four lines per second
SMOOTH-2	Two lines per second
SMOOTH-1	One line per second
SCRN SAVER	If the terminal receives no data for approximately 15 minutes,
ON	The screen blanks until you press a key (no data is lost)
OFF	Screen data displays continuously
STATUS LINE	The screen displays
STANDARD	A status line with time and cursor line and column indicators
EDITING	A status line with editing status messages
OFF	No status line

Table 2-3 F2 GENERAL:  
General Setup Parameters

Parameter	Explanation
ANSWERBACK	The answerback message is
CONCEAL	
OFF	Displayed in setup mode
ON <sup>1</sup>	Concealed
ANSWERBACK	The answerback message is
MODE <sup>2</sup>	
OFF	Not sent
ON	Sent to the computer
COMM MODE	The terminal's communication mode is
FULL DUPLEX	Full duplex
BLOCK	Block
HALF DUPLEX	Half duplex
HALF BLOCK	Half-duplex block
ENHANCE	In some nonnative terminal personalities, an enhanced set of codes is
ON	Recognized by the terminal
OFF	Not recognized by the terminal

1. If you conceal the message, you can't redisplay it—the message stays concealed until you redefine it. The parameter defaults to off when you redefine the message.

2. In ANSI modes, the answerback message is always set in response to ENQ (CTRL-E) or if CTRL BREAK is pressed. In ANSI mode this field determines if answerback message is sent at power-on.

Table 2-3 Continued

Parameter	Explanation
FONT LOAD	When changing personalities or the character cell size, the terminal ON Loads the appropriate character set OFF Doesn't change the current character set
RESTORE TABS	When the terminal is turned on, tab stops are OFF Cleared ON Initialized from nonvolatile memory
MONITOR	The terminal OFF Executes escape sequences and control codes ON Displays symbols for escape sequences and control codes without acting on them <sup>3</sup>
PERSONALITY <sup>4,5</sup>	The terminal can run programs written for the following terminals: WY-99GT Native mode WY50+ WY-50, WY-50+, WY-100 TVI 910+ TeleVideo 910 and 910+ TVI 912/920 TeleVideo 912 and 920 TVI 925 TeleVideo 925 TVI 950 TeleVideo 950 PC TERM PC terminal ADDS A2 ADDS Viewpoint A2 HZ 1500 Hazeline 1500 ADM-31 Lear Siegler ADM 31, ADM 3A, ADM 5 VT52 Digital Equipment VT52 VT100 Digital Equipment VT100 VT220-7 Digital Equipment VT220, 7-bit mode VT220-8 Digital Equipment VT220, 8-bit mode TEK 4010/4014 Tektronix 4010/4014 PC GRAPHICS PC graphics
RCVD CR	When the terminal receives an ASCII CR, the cursor moves to the beginning of the CR Current line CRLF Next line
SEND ACK <sup>6</sup>	After executing certain commands, the terminal sends ON An ASCII ACK character to the computer OFF No acknowledgment

3. See WyseWorks ASCII Table for symbols displayed.

4. When you select a new terminal personality, the terminal displays the appropriate character set unless the FONT LOAD parameter is set to off.

5. Caution The terminal may clear the entire display memory when you change its personality.

6. ACK is sent for font load, font clear, and MODEM or AUX port changes. SEND ACK must be ON to send an answerback in ASCII modes.

Table 2-3 Continued

Parameter	Explanation
TEST OFF ON	The terminal is ready for Normal operation A manufacturing self-test (don't select this value)
WIDTH CHANGE CLEAR OFF ON	When executing a command to change the number of columns, the terminal Doesn't clear the screen Clears the screen

Table 2-4 F3 KEYBRD:  
Keyboard Setup Parameters

Parameter	Explanation
BREAK 250MS 170MS 500MS OFF	The terminal sends a break signal on the data port for 250 milliseconds 170 milliseconds 500 milliseconds No break
CORNER KEY* FUNCT HOLD	Pressing the corner key Together with an alphanumeric key sends an ASCII SOH, the other key's code, and an ASCII CR Freezes the current data on the screen until the key is pressed again
ENTER CR CRLF TAB	ENTER sends the ASCII character for Carriage return (CR) Carriage return (CR) and linefeed (LF) Horizontal tab (HT)
FKEY XMT LIMIT NONE 60CPS 150CPS	The terminal sends function key definitions As fast as the baud rate allows At a maximum rate of 60 characters per second At a maximum rate of 150 characters per second
KEY REPEAT ON OFF	When held down for more than half a second, the keys Repeat Don't repeat
KEYCLICK ON OFF	Each time a key is pressed or repeated, A muted beep sounds No beep sounds

\* FUNCT, HOLD, or SCROLL LOCK, depending on your keyboard.

Table 2-4 Continued

Parameter	Explanation
KEYLOCK CAPS REV SHIFT	When CAPS LOCK is engaged, Alphabetic keys generate only uppercase characters The action of SHIFT is reversed—shifted alphabetic keys generate lowercase characters, unshifted keys generate uppercase characters All keys generate shifted characters only
LANGUAGE	Choose the setting that matches your keyboard language.
MARGIN BELL OFF ON	The terminal's margin bell Doesn't ring Rings when the cursor reaches the column where margin bell is set (default is column 72 in 80-column mode, column 124 in 132-column mode)
PRINTER RECEIVE OFF ON MOUSE	Data received on the printer port Is ignored Is sent to the host Is processed as data from a pointing device
RETURN CR CRLF TAB	RETURN sends the ASCII character for Carriage return (CR) Carriage return (CR) and linefeed (LF) Horizontal tab (HT)
XMT LIMIT NONE 60CPS 150CPS	The terminal sends data through the data port As fast as the baud rate allows At a maximum rate of 60 characters per second At a maximum rate of 150 characters per second

Table 2-5 F4 COMM:  
Communication Setup  
Parameters

Parameter	Explanation
AUX BAUD RATE 50 110 134.5 200 300 600 1200	The AUX port transmit and receive baud rate is 2400 4800 7200 9600 <sup>1</sup> 19200 38400
1. Default.	

Table 2-5 Continued

Parameter	Explanation
AUX DATA/STOP BITS	Through the AUX port, the terminal sends and receives
8/1	8-bit data with one stop bit
7/2	7-bit data with two stop bits
8/2	8-bit data with two stop bits
7/1	7-bit data with one stop bit
AUX PARITY <sup>2</sup>	The terminal sends data to the AUX port with
NONE	No parity bit
ODD	Odd parity
MARK	A high (mark) parity bit
EVEN	Even parity
SPACE	A low (space) parity bit
AUX DRCV HNDSHAKE	The terminal controls the receipt of data from a device connected to the AUX port by
DTR	DTR handshaking (raising and lowering the DTR line voltage)
BOTH	Both X-on/X-off and DTR handshaking
NONE	No handshaking protocol
XON/XOFF	X-on/X-off handshaking
AUX XMT HNDSHAKE	When sending data to a device connected to the AUX port, the terminal
NONE	Ignores all incoming software handshaking signals
XON/XOFF	Responds to X-on/X-off handshaking
DSR	DSR handshaking
BOTH	Both X-on/X-off and DSR handshaking
DATA/PRINTER MODEM/AUX	The terminal communicates with the computer through
AUX/MODEM	The MODEM port (AUX port is printer port) The AUX port (MODEM port is printer port)
MDM DATA/STOP BITS	Through the MODEM port, the terminal sends and receives
8/1	8-bit data with one stop bit
7/2	7-bit data with two stop bits
8/2	8-bit data with two stop bits
7/1	7-bit data with one stop bit
MDM PARITY <sup>3</sup>	The terminal sends data to the MODEM port with
NONE	No parity bit
ODD	Odd parity
MARK	A high (mark) parity bit
EVEN	Even parity
SPACE	Space parity

2. The terminal ignores any incoming parity bits.

3. The terminal ignores any incoming parity bits in ASCII modes.

Table 2-5 Continued

Parameter	Explanation
MDM RCV BAUD RATE	The MODEM port receive rate is
50	2400
110	4800
134.5	7200
200	9600 <sup>1</sup>
300	19200
600	38400
1200	
MDM RCV HNDSHAKE	The terminal controls receipt of data from a device connected to the MODEM port by
NONE	No handshaking protocol
XON/XOFF	X-on/X-off handshaking
DTR	DTR handshaking (raising and lowering the DTR line voltage)
BOTH	Both X-on/X-off and DTR handshaking signals
MDM XMT BAUD RATE	The MODEM port transmit rate is
50	2400
110	4800
134.5	7200
200	9600 <sup>1</sup>
300	19200
600	38400
1200	
MDM XMT HNDSHAKE	When sending data to a device connected to the MODEM port, the terminal
NONE	Ignores all incoming software handshaking signals
XON/XOFF	Responds to X-on/X-off handshaking
DSR	DSR handshaking
BOTH	Both X-on/X-off and DSR handshaking

Table 2-6A F5 MISC1:  
Misc Setup Parameters  
(ASCII Personalities)\*

Parameter	Explanation
AUTO PAGE OFF	When the cursor reaches the top or bottom of the page, It wraps on the page or the data scrolls, depending on the AUTOSCRL parameter setting
ON	A new page of memory moves onto the screen

\* Parameters displayed when the terminal is in ASCII personalities. See Table 2-6B if you are in ANSI or TEK personalities.

Table 2-6A Continued

Parameter	Explanation
LINE/BLOCK END US/CR CRLF/ETX	When the terminal sends a block of data to the computer, the Line terminator is an ASCII US character, block terminator is an ASCII CR character Line terminators are ASCII CR and LF characters, the block terminator is an ASCII ETX character
PAGE EDIT OFF ON	The terminal's editing functions affect the Cursor line Entire page

Table 2-6B F5 MISC1:  
Misc Setup Parameters  
(ANSI Personalities)\*

Parameter	Explanation
CURSOR KEYS NORMAL APPLICATION	The cursor keys send Their standard sequences Application-specific sequences, see Appendix B
DEL DEL/CAN BS/DEL	DEL sends The delete code; shifted, it sends the cancel code The backspace code; shifted, it sends the delete code
FEATURE LOCK OFF ON	When feature lock is The host can change all features Key auto-repeat, scroll speed, screen background, tab stops, and keyboard lock are locked and cannot be changed by escape sequences from the host
F-KEY LOCK OFF ON	When F-key lock is The host can change function-key definitions Function key definitions are locked and cannot be changed by the host
KEYPAD NUMERIC APPLICATION	When KEYPAD is The numeric keypad keys send standard codes The numeric keypad keys send application codes, see Appendix B
WARNING BELL ON OFF	When WARNING BELL is The terminal sounds a bell when it receives a BELL code The terminal ignores the BELL code

\* Parameters activated only when the terminal is in ANSI or TEK graphics personalities.  
See Table 2-6A if you are in ASCII personalities.

Table 2-6B Continued

Parameter	Explanation
XFER TERM	The terminal transmits screen or line blocks of data to the host that end at the
EOS	End of the screen or line
CURSOR	Cursor position
MARGIN CONTROL	(Tektronix 4010/4014 mode only) The alpha portion of the graphics terminal
0	Doesn't generate a page full signal
1	Sends a page full signal at the end of margin 1
2	Sends a page full signal at the end of margin 2
DEL = LOW Y	(Tektronix 4010/4014 mode only) The DEL character
ON	Can be used for low-order Y addressing
OFF	Cannot be used for low-order Y addressing; use ESC ? instead
GIN TERMINATOR	(Tektronix 4010/4014 mode only) Upon receipt of a graphics input sequence
CR	A CR character is sent
CR/EOT	A CR/EOT character is sent
NONE	No terminator is sent

Table 2-7A F6 MISC2:  
Misc Setup Parameters  
(ASCII Personalities)\*

Parameter	Explanation
WPRT INTENSITY	Write-protected characters appear
DIM	Dim
NORMAL	Normal
INVISIBLE	Invisible
WPRT REVERSE	Write-protected characters appear as
OFF	Light characters on a dark background
ON	Dark characters on a light background
WPRT UNDERLINE	Write-protected characters are
OFF	Not underlined
ON	Underlined

\* Parameters displayed when the terminal is in a non-ANSI personality. See Table 2-7B if you are in ANSI or TEK personalities.

**Table 2-7B F6 MISC2:  
Misc Setup Parameters  
(ANSI Personalities)\***

Parameter	Explanation
DISCONNECT 2 SEC	When the parameter PORT = EIA MODEM is selected The terminal disconnects if the carrier is lost for two seconds
60 MSEC	The terminal disconnects if the carrier is lost for 60 milliseconds
LOCAL OFF	All data received from the host Is accepted; keyboard data can be processed locally, sent to the host, or both depending on other terminal modes
ON	Is ignored, keyboard data is processed locally
PORT EIA DATA EIA MODEM RS-422	The terminal transmits and receives via RS-232-C data pins RS-232-C modem signals RS-422 signal levels
PRINT ASCII  DRAW/ASCII  ALL	During printing Escape sequences are not sent and non-ASCII characters are replaced with underscores Escape sequences and control codes are sent, allowing ASCII and DEC line drawing graphics characters, character attributes, and double size lines to be printed Escape sequences and control codes are sent, allowing the printing of ASCII, line drawing, multinational, double size lines, soft-font characters, and character attributes
PRINT AREA SCREEN SCROLL RGN	Print operations extend to the Entire screen Defined scrolling region
PRINT MODE NORMAL  AUTO  CTRL	Data is sent to the printer In response to PRINT keystrokes or PRINT escape codes from the host After processing a linefeed, formfeed, or vertical tab; following an autowrap operation From the host, without being displayed
PRINT TERM NONE FF	Following print operations No termination code is sent to the printer The formfeed code (0CH) is sent to the printer
SEND ALL ERASABLE	In block transmissions Erasable and non-erasable data is sent to the host Only erasable data is sent to the host

\* Parameters displayed when the terminal is in ANSI or TEK personalities. See Table 2-7A if you are in an ASCII personality.

Table 2-7B Continued

Parameter	Explanation
SEND AREA SCREEN SCROLL RGN	In a SEND SCREEN operation, The entire screen is sent to the host Only data in the scrolling region is sent to the host
SEND TERM NONE FF	Following a SEND SCREEN operation, No character is sent The formfeed code (0CH) is sent

**F7 TABS: Defining Tab Stops**

When the RESTORE TABS parameter (Table 2-3) is set to *off*, no tab stops are set when you turn on the terminal. When the RESTORE TABS parameter is set to *on*, the terminal activates the tab stops last saved in nonvolatile memory.

You can clear and set tab stops from the tabs setup level (F7) and save the changes in nonvolatile memory by choosing the SAVE ALL option when you exit setup mode.

**Tabs Setup Level**

On the tabs setup level screen, the terminal's current tab stops are indicated by uppercase T's displayed along a line of periods that mark each column position.

- A tab stop in columns 2 through 78 is shown as a T in the upper line of periods.
- A tab stop in columns 79 through 132 is shown as a T in the lower line of periods.

You can easily determine where tabs are set by moving the cursor across the line and reading the column number displayed in the second instruction line at the top of the screen.

Clear and set tabs anywhere on the line, as follows:

- To move the cursor across the line, press **▶** or **◀**.
- To either clear or set (toggle) an individual tab stop at the cursor position, press **Spacebar**.
- To clear all tabs, press **Home**.
- To set tabs every eighth column, press **Backspace**.

**Note** A tab stop cannot be set in column 1.

---

**F8 F/KEYS: Redefining the Keys**

You can redefine the function keys and editing keys, both shifted and unshifted, to send a unique character string of up to 64 characters. You can also redefine a key's *direction*, which determines where the terminal sends the key definition.

To redefine a key, press **F8** to display the keys setup level. Refer to the functions indicated at the top of the screen and follow these steps:

- 1 Select the key to be redefined by pressing that key together with **Ctrl**. This highlights the key's direction and definition fields.
- 2 Press **▲** or **▼** to highlight the unshifted or shifted key definition field.
- 3 Enter the key definition (up to 64 characters) at the cursor position. Correct errors by pressing **◀** to delete characters or **Home** to clear the definition.
- 4 If you want to change the key's direction, press **Enter** until your choice appears: *remote*, *local*, or *normal*.
  - **Remote**  
Data is sent to the computer only, regardless of the terminal's communication mode. (Default)
  - **Local**  
Data is sent to the terminal only, regardless of the terminal's communication mode.
  - **Normal**  
Data is sent to the computer and/or the terminal, depending on the terminal's communication mode.

---

**F9 A/BACK: Defining an Answerback Message**

In the answerback setup level (F9) you can program a message of up to 20 characters to identify the terminal to the computer. Enter the message at the cursor position. Correct errors by pressing **Backspace** to delete characters or **Home** to clear the message.

The answerback message shares approximately 350 bytes of nonvolatile memory with key redefinitions and function key labels. To save the message in nonvolatile memory, exit setup mode with the **SAVE ALL** option.

In ASCII modes, the answerback message is sent when

- o The terminal receives an ASCII ENQ code (CTRL E),
- o The ANSWERBACK mode parameter (Table 2-2) is set to ON,
- o And the SEND ACK parameter (Table 2-3) is set to ON

In ANSI modes, the answerback message is sent when

- o The terminal receives an ASCII ENQ code (CTRL E)
- o Or **Ctrl**, **Shift**, and **Break** are pressed

In ANSI modes, if the ANSWERBACK MODE parameter is ON, then auto-answerback is enabled. The terminal sends the answerback message when

- o It is powered on,
- o Or for a disconnect/reconnect

If the ANSWERBACK CONCEAL parameter (Table 2-2) is set to *on*, the word *CONCEALED* displays in place of the message. The message can't be displayed again until you redefine it.

---

## Memory Space

To save key definitions in nonvolatile memory, choose the SAVE ALL option to exit setup mode. Key definitions share a total of approximately 350 bytes of nonvolatile memory space with the answerback message and function key labels. If you enter more than 64 characters for any one key or reach the 350-character overall limit, you'll hear a warning beep and won't be able to enter more characters.

- Note** If you connect another keyboard to the terminal after you've saved key definitions in nonvolatile memory, clear the definitions to their default values.



# 3

# Operating the Terminal

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## Keyboard Functions

The three U.S. keyboards supported by the terminal are illustrated in Appendix B, which lists the codes sent by the keys in each of the terminal's ASCII personalities. Table D-1 in Appendix D lists the key sequences that control the terminal locally.

Key functions for the terminal's calculator and other desktop accessories are described in Chapter 4, "WyseWorks."

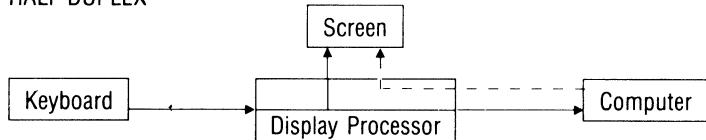
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## Communication Modes

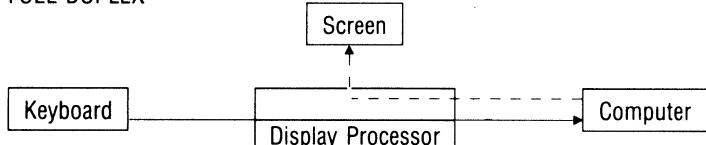
Four modes of communication are possible between the terminal and an attached computer (in ASCII personalities): full duplex, half duplex, block, and half-duplex block. The terminal handles data in these communication modes as illustrated here.

---

### HALF DUPLEX

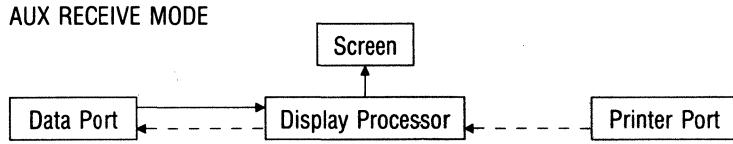
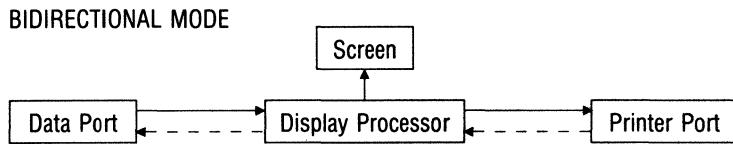
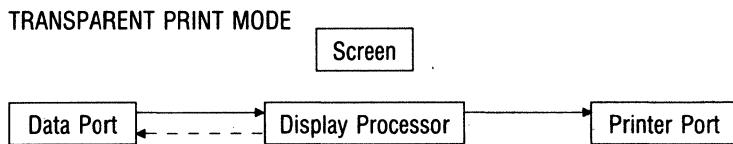
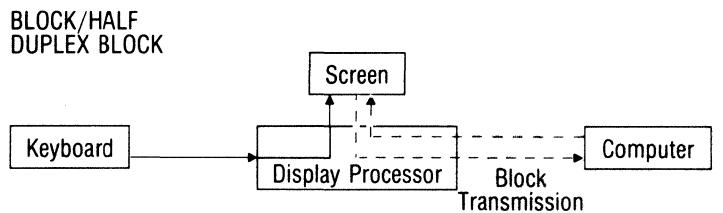


### FULL DUPLEX



#### Legend:

→ From Keyboard      ← - - - - To/From Computer



Legend:

→ From Data Port    ← - - - - From Display Processor/Printer Port

---

---

**Printing**

The terminal is set up to communicate with a printer through the AUX port. If you choose to connect the printer to the MODEM port instead, reverse the functions of the ports by changing the DATA/PRINTER parameter in setup mode. (Appendix A gives the connector pin assignments for both ports. Appendix D contains corresponding keys for the ASCII and Enhanced PC-style keyboards.)

To print data coming from the computer,

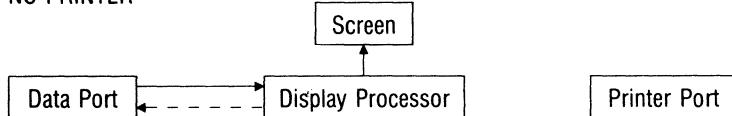
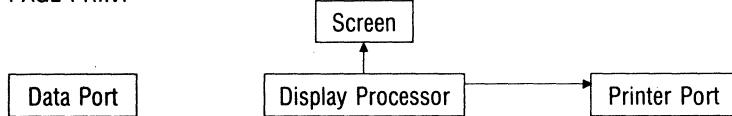
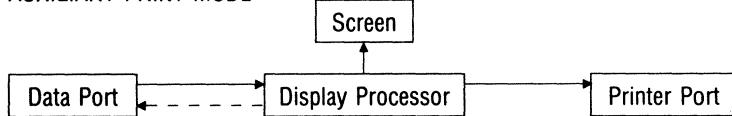
- o Make sure the printer port is configured for transmit handshaking that matches the requirements of your printer.
- o Press **Ctrl** and **Print Scrn** to turn on auxiliary print mode.

To print a screenful of data when you have a serial printer connected directly to the terminal,

- o Press **Ctrl**, **Shift**, and **. kpd**.

The following illustration shows how the terminal handles data through the printer port.

---

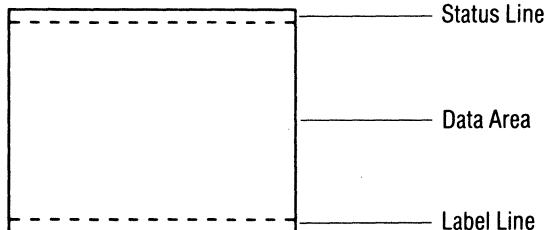
**NO PRINTER****PAGE PRINT****AUXILIARY PRINT MODE**

---

**Screen Areas**

The screen has three display areas: the *status line*, the *data area*, and the *label line*.

---



Unless you turn off the status line display in setup mode or with an escape sequence, the top line of the screen displays terminal or computer status messages.

The bottom line of the screen can display function key labels or a single longer message, or it can be an extra data line on the 25 line screen.

The data area of the screen is the portion of a page of display memory that can be viewed at any one time. The default data area is 24 data lines.

# 4

# WyseWorks

---

## Introducing WyseWorks

WyseWorks is a set of four desktop accessories:

- A calculator with a visual paper tape feature that displays and prints the results of your calculations
- An alarm clock with two alarm settings and reminder messages
- A perpetual calendar that displays three months at a glance
- An ASCII table displaying numerical equivalents and monitor mode symbols for 128 ASCII characters

You have access to these accessories at any time except when the terminal is in setup mode. They are displayed on the top eight lines of the screen, which temporarily changes to 80 columns. (Overlaid data and the previous screen width are restored when you exit WyseWorks.)

---

## Basic WyseWorks Controls

Press **Ctrl** **Lock** (**Ctrl** **Caps Lock**) to display the WyseWorks welcome screen, where the fields at the bottom of the screen display the name of each accessory. Follow these steps:

- 1 To select an accessory, press the indicated function key. The accessory will appear in the box at the top of the screen.
- 2 After you've selected an accessory, follow the instructions on the screen, referring to the explanations in this chapter.
- 3 When you're ready to leave an accessory,
  - Press **Ctrl** **Lock** (**Ctrl** **Caps Lock**) to leave WyseWorks, or
  - Press **F10** to return to the welcome screen to select another accessory

---

**Calculator**

The calculator works very much like a desktop calculator, with the keyboard acting as the numeric keypad and the screen displaying the results of your calculations. A visual tape feature allows you to display five entries at a time and send them to a printer connected directly to the terminal.

---

**Calculator Display**

In the box at the top of the screen the display shows

- A keypad that highlights the numbers and functions as you enter them on the keyboard
- Five memory locations, with a pointer (<m>) indicating the active memory where you can store and recall your current calculation.

The two fields at the bottom of the screen indicate the function keys that turn the paper tape feature's display and print functions on or off. The current status (on or off) is shown in each field.

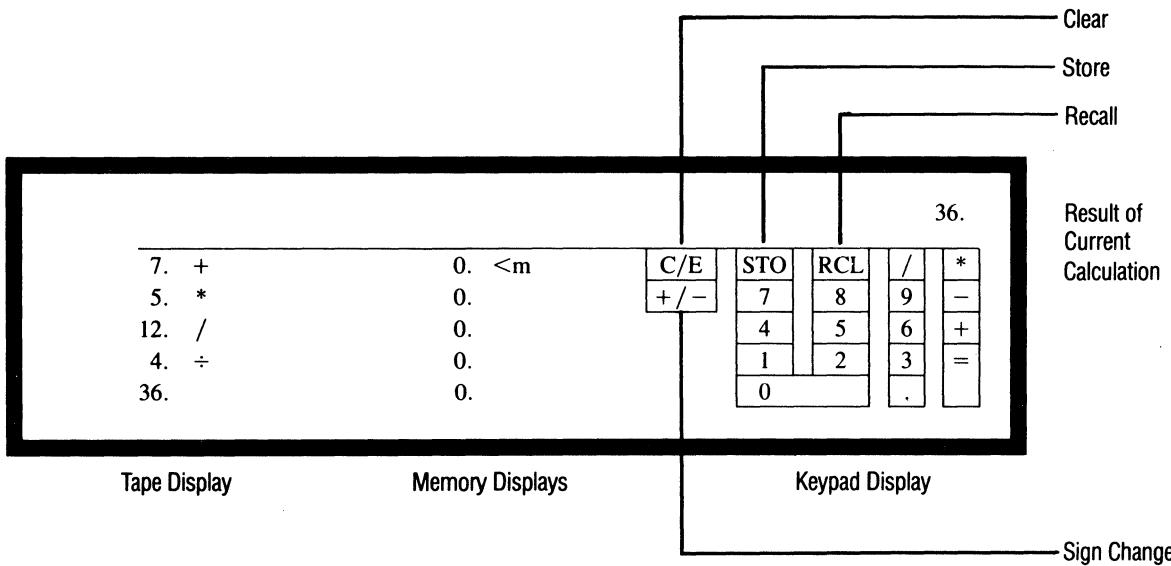
- When the tape is *on*, each keyboard entry appears at the left of the calculator display (see illustration), scrolling up like a paper tape. When more than five entries are made, the top entry scrolls off.
- When the printer is also *on*, each successive bottom line of the tape is sent to the port configured as the printer port.

The following illustration shows the calculator's display of the calculation

$$[(7 + 5) \times 12] \div 4 =$$

when the tape display is on.

- Note** The keypad display shown in the illustration corresponds to keys on the ASCII keyboard. The actual display reflects the keys that perform calculator functions on the keyboard installed on the terminal.



## Calculator Operations

The calculator has an absolute numerical range of  $\pm 9,999,999,999.9999$ .

## Visual Tape Feature

Both the tape display and printer are *off* when you turn on the terminal and first enter WyseWorks. To turn on the tape display, press **F1**. To activate the printer, press **F2**. Observe the following precautions:

- Turn on the tape *before* starting your calculation—turning it on clears existing entries.
- Don't turn the printer on unless the tape display is also on and a printer is connected directly to the terminal.

Until you turn off the terminal, the status of the tape display and printer will remain as you last set them.

**Keyboard Controls**

Table 4-1 summarizes the calculator operations that you can perform from the keyboard. The corresponding keypad display on the screen is highlighted as you make each entry on the numeric keypad on the keyboard.

**Table 4-1 Calculator Controls**

Control	Description
C/E	Clear Pressed twice, clear all Shifted, clear the selected memory Shifted, pressed twice, clear all memories
STO	Stores number in the selected memory
▲▼	Move memory pointer (<m>)
RCL	Recalls number from storage to the display
+/-	Change sign
*	Multiply
/	Divide
-	Subtract
+	Add
=	Produce result
/ =	Reciprocal
* =	Square

**Error Messages**

If your calculation exceeds 14 digits or if a number has been divided by zero, an error message appears on the top line of the screen (the status line):

\*\*Number too large\*\*

\*\*Division by zero\*\*

If this happens, clear the calculation and recalculate.

---

**Alarm Clock**

In the alarm clock accessory you can set two alarm times and enter two 20-character reminder messages. At the set time, the alarm sounds for 30 seconds, and any reminder message is simultaneously displayed on the status line.

- Note** The alarm sounds only during normal terminal operation, not while the terminal is in WyseWorks or setup mode.
- 

**Alarm Clock Display**

The alarm clock display shows

- The current time according to the terminal's clock (default 8:00 a.m.)
  - Two alarm setting lines—Alarm 1 and Alarm 2—each with a time field (default 12:00 a.m.), a 20-character message field, and an on/off indicator field
- 

**Setting the Alarm**

Position the cursor in the appropriate fields:

- 1 Press the cursor keys or **Tab** or **Backspace** to go from field to field. Pressing **Return** (**Enter**) moves the cursor to the start of a line.
  - 2 To reset the terminal's clock, enter the current time (12-hour format, including a.m or p.m.) in the time field.
  - 3 Enter the desired alarm time in the Alarm 1 or Alarm 2 time field and the desired message in the message field.
  - 4 In the on/off indicator field, press any key to toggle the alarm bell to *on/off*.
- Note** After the alarm sounds, the indicator defaults to *off*, but the time setting and message remain until you redefine them or turn off the terminal.
- 

**Turning Off the Alarm**

To turn off the alarm, press **Setup** (**Select**).

Before you can resume normal operation or reenter WyseWorks, you must press **Setup** (**Select**) again to clear the message displayed on the status line.

---

**Calendar**

The calendar displays three months at a time, defaulting to the factory setting when the terminal is turned on. (If more than five lines are required to include all the days, the leftover days of the month won't appear.)

---

**Calendar Controls**

To display other months in the year, press

-  ( for earlier months
-  ( for later months

To display the same months in another year, press

-  ( for earlier years
  -  ( for later years
- 

**ASCII Table**

The two-page ASCII table displays the hexadecimal codes for the U.S. ASCII table (64 codes per page), showing the monitor mode symbols for the current terminal personality.

The status line displays the corresponding ASCII character of control code, as well as binary, decimal, and octal equivalents, for the hexadecimal code that's highlighted in the table.

---

**ASCII Table Controls**

Press the cursor keys to highlight the codes. Press **Return** (**Enter**) to highlight the code at the start of a line.

Press **F1** to display the alternate page.

Appendix

# A Connector Pin Assignments

Table A-1 MODEM Port  
Connector Pin Assignments  
(DTE)

Pin	Signal	Mnemonic	Direction
1	Shield ground	PGND	
2	Transmit data	TXD	Out
3	Receive data	RXD	In
4	Request to send	RTS	Out
5	Clear to send	CTS	In
6	Data set ready	DSR	In
7	Signal ground	SGND	
8	Data carrier detect	DCD	In
12	Speed indicator	SPDI	In
15	Receive data - (RS422)	RX-	
17	Receive data + (RS422)	RX+	
19	Transmit data - (RS422)	TX-	
20	Data terminal ready	DTR	Out
23	Speed select	SPDS	Out
25	Transmit data + (RS422)	TX+	

Table A-2 AUX Port Connector  
Pin Assignments (DTE)

Pin	Signal	Mnemonic	Direction
1	Shield ground	PGND	
2	Transmit data	TXD	Out
3	Receive data	RXD	In
4	Request to send	RTS	Out
5	Clear to send	CTS	In
6	Data set ready	DSR	In
7	Signal ground	SGND	
20	Data terminal ready	DTR	Out

## Appendix

**B** Key Codes

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**Introduction**

This appendix lists the key codes for the terminal's ASCII and ANSI personalities.

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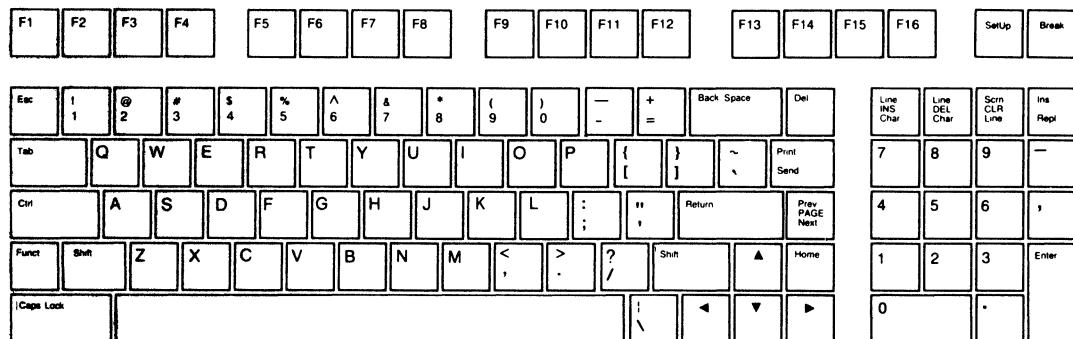
**ASCII Key Codes**

Tables B-1 through B-3 list ASCII codes for each of the three keyboards available for the terminal. Codes are given for editing and special keys only. Alphanumeric keys send the standard ASCII codes (see WyseWorks ASCII Table).

Table B-4 summarizes the hexadecimal values of the scan codes sent by the keys on all keyboards when the terminal is in the PC Term personality: each key sends one scan code when pressed (the *down* code) and another code when released (the *up* code)

- The table gives the codes for the editing and special keys only.
- Scan codes for the alphanumeric and function keys are shown on the VT220- and Enhanced PC-style keyboard illustrations. Only the down codes are shown—the high bit is set when the key is released. (The same codes are sent by the alphanumeric and function keys on the other keyboards when the terminal is in the PC Term personality.)

Table B-5 lists function key default codes for all keyboards and all ASCII personalities except PC Term.

**Table B-1 Editing and Special Key Codes—WY-99GT ASCII Keyboard**

Key	Native <sup>1</sup> Code	Hex. Value	ADDS VP A2	HZ 1500
BACKSPACE	CTRL H	08	CTRL H	CTRL H
CLR LINE	ESC T	1B 54	ESC K	~ CTRL O
CLR SCRN	ESC Y	1B59	ESC k	~ CTRL X
▼	CTRL J <sup>2</sup>	0A	CTRL J	~ CTRL K
◀	CTRL H	08	CTRL U	CTRL H
▶	CTRL L	0C	CTRL F	CTRL P
▲ <sup>3</sup>	CTRL K	0B	CTRL Z	~ CTRL L
DEL	DEL	7F	DEL	DEL
DEL CHAR	ESC W	1B 57	ESC W	
DEL LINE	ESC R	1B 52	ESC I	
ENTER <sup>4</sup>	CTRL M or CTRL M CTRL J or CTRL I	0D 0D, 0A 09	CTRL M or CTRL M CTRL J or CTRL I	CTRL M or CTRL M CTRL J or CTRL I
ESC	CTRL [	1B	CTRL [	CTRL [

1. These codes also recognized in WY-50+, ADM 31, and TeleVideo 910+/920/925/950 modes. Unless otherwise noted, shifted keys send the same code as unshifted.

2. CTRL V if the terminal is in TeleVideo 925 or 950 mode.

3. Shifted key sends ESC j in TeleVideo 925 or 950 mode.

4. Code depends on selection in setup mode. Shifted key sends no code (toggles keyclick).

Table B-1 Continued

Key	Native <sup>1</sup> Code	Hex. Value	ADDS VP A2	HZ 1500
HOME	CTRL ^	1E	CTRL A	~ CTRL R
SHIFT HOME	ESC {	1B 78	CTRL A	~ CTRL R
INS	ESC q	1B 71	ESC q	CTRL U
INS CHAR	ESC Q	1B 51	ESC Q	
INS LINE	ESC E	1B 45	ESC M	~ CTRL Z
PAGE NEXT	ESC K	1B 45	ESC J	
PAGE PREV	ESC J	1B 4A	ESC J	
PRINT	ESC P	1B 50	ESC P	CTRL F
REPL	ESC r	1B 72	ESC r	CTRL D
RETURN	CTRL M or CTRL M CTRL J or CTRL I	0D 0D, 0A 09	CTRL M or CTRL M CTRL J	CTRL M or CTRL M CTRL J
SEND	ESC 7	1B 37	ESC 7	~ 7
TAB	CTRL I	09	CTRL I	CTRL I
SHIFT TAB	ESC I	1B 49	ESC O	

Table B-2 Editing and Special Key Codes—VT220-Style Keyboard

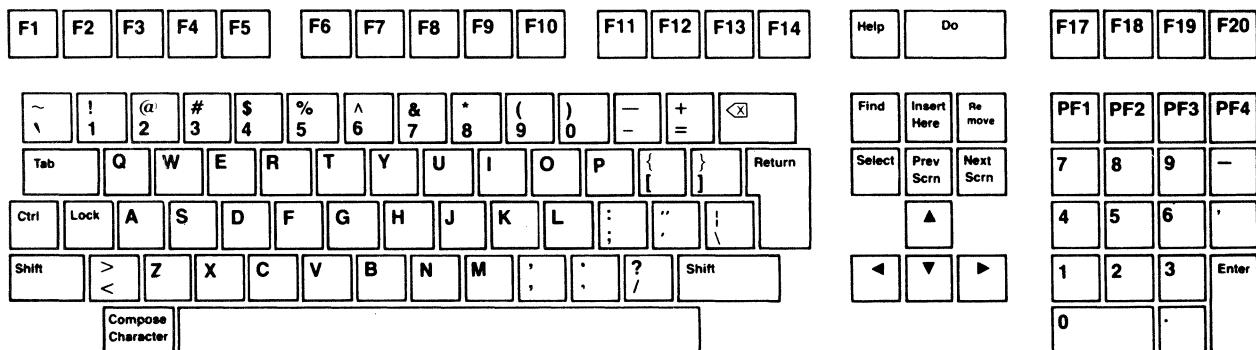


Table B-2 Continued

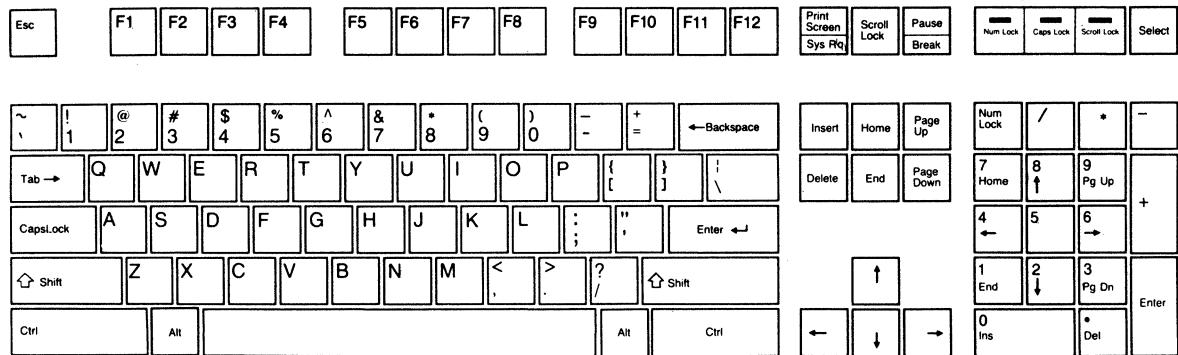
Key	Native <sup>1</sup> Code	Hex. Value	ADDS VP A2	HZ 1500
◀	CTRL H	08	CTRL H	CTRL H
▼	CTRL J <sup>2</sup>	0A	CTRL J	~ CTRL K
◀	CTRL H	08	CTRL U	CTRL H
▶	CTRL L	0C	CTRL F	CTRL P
▲ <sup>3</sup>	CTRL K	0B	CTRL Z	~ CTRL L
ENTER <sup>4</sup>	CTRL M or CTRL M CTRL J or CTRL I	0D 0D, 0A 09	CTRL M or CTRL M CTRL J or CTRL I	CTRL M or CTRL M CTRL J or CTRL I
INSERT HERE (PF1)	ESC Q	1B 51	ESC Q	
SHIFT INSERT (SHIFT PF1)	ESC E	1B 45	ESC M	~ CTRL Z
PF2	ESC W	1B 57	ESC W	
SHIFT PF2	ESC R	1B 52	ESC I	
PF3	ESC T	1B 54	ESC K	~ CTRL O
SHIFT PF3	ESC Y	1B 59	ESC k	~ CTRL X
PF4	ESC r	1B 72	ESC r	CTRL D
SHIFT PF4	ESC q	1B 71	ESC q	CTRL U
NEXT SCRN	ESC K	1B 45	ESC J	
PREV SCRN	ESC J	1B 4A	ESC J	
F2 (PRINT SCRN)	ESC P	1B 50	ESC P	CTRL F
REMOVE	DEL	7F	DEL	DEL
RETURN	CTRL M or CTRL M CTRL J or CTRL I	0D 0D 0A 09	CTRL M or CTRL M CTRL J	CTRL M CTRL J
SHIFT F4 (SEND)	ESC 7	1B 37	ESC 7	~ 7
TAB	CTRL I	09	CTRL I	CTRL I
SHIFT TAB	ESC I	1B 49	ESC O	

1. These codes are also recognized in WY-50+, ADM 31, and TeleVideo 910+/920/925/950 modes. Unless otherwise noted, shifted keys send the same code as unshifted.

2. CTRL V if the terminal is in TeleVideo 925 or 950 mode.

3. Shifted key sends ESC j in TeleVideo 925 or 950 mode.

4. Code depends on selection in setup mode. Shifted key sends no code (toggles keyclick).

**Table B-3 Editing and Special Key Codes—Enhanced PC-Style Keyboard<sup>1</sup>**

Key	Native <sup>2</sup> Code	Hex. Value	ADDS VP A2	HZ 1500
←BACKSPACE	CTRL H	08	CTRL H	CTRL H
↓	CTRL J <sup>3</sup>	0A	CTRL J	~ CTRL K
←	CTRL H	08	CTRL U	CTRL H
→	CTRL L	0C	CTRL F	CTRL P
↑ <sup>4</sup>	CTRL K	0B	CTRL Z	~ CTRL L
DELETE	DEL	7F	DEL	DEL
END	ESC T	1B 54	ESC K	~ CTRL O
SHIFT END	ESC Y	1B 59	ESC k	~ CTRL X
ENTER <sup>5</sup>	CTRL M or CTRL M CTRL J or CTRL I	0D 0D, OA CTRL J or CTRL I	CTRL M or CTRL M CTRL J or CTRL I	CTRL M or CTRL M CTRL J or CTRL I
ESC	CTRL [	1B	CTRL [	CTRL [

1. Codes shown on keyboard layout are alphanumeric and function key scan codes sent in PC Term mode on all keyboards (the high bit is set when the key is released). See Table B-4 for scan codes sent by the editing and special keys in this mode.
2. These codes are also recognized in WY-50+, ADM 31, and TeleVideo 910+/920/925/950 modes. Unless otherwise noted, shifted keys send the same code as unshifted.
3. CTRL V if the terminal is in TeleVideo 925 or 950 mode.
4. Shifted key sends ESC j in TeleVideo 925 or 950 mode.
5. Code depends on selection in setup mode. Shifted key sends no code (toggles keyclick).

Table B-3 Continued

Key	Native <sup>2</sup> Code	Hex. Value	ADDS VP A2	HZ 1500
HOME	CTRL ^	1E	CTRL A	- CTRL R
INSERT	ESC q	1B 71	ESC q	CTRL U
SHIFT INSERT	ESC r	1B 72	ESC r	CTRL D
PAGE DOWN	ESC K	1B 45	ESC J	
PAGE UP	ESC J	1B 4A	ESC J	
PRT SCREEN	ESC P	1B 50	ESC P	CTRL F
TAB →	CTRL I	09	CTRL I	CTRL I
SHIFT TAB →	ESC I	1B 49	ESC O	

Table B-4 Editing and Special Key Codes in PC Term Personality

Keyboard Style	ASCII	VT220	Enhanced PC	Hexadecimal Scan Codes	
				PC Term Mode DN	UP
FUNCT	COMPOSE CHARACTER		LEFT ALT	38	B8
			RIGHT ALT	E0 38	E0 B8
BACKSPACE	☒		←BACKSPACE	0E	8E
CTRL BREAK	CTRL F20		BREAK	E0 46	E0 C6
CAPS LOCK	LOCK		CAPS LOCK	3A	BA
CTRL	CTRL		LEFT CTRL RIGHT CTRL	1D E0 1D	9D E0 9D
RETURN	RETURN		ENTER	1C	9C
ENTER	ENTER		ENTER <sup>kp</sup>	E0 1C	E0 9C
ESC	F19		ESC	01	81
F15 <sup>1</sup>	PF1 <sup>1</sup>		NUM LOCK <sup>1</sup>	45	C5
BREAK	F20		PAUSE	E1 1D 45 E1 9D C5	(none)
REPL	PF4		* <sup>kp</sup>	37	B7
SEND	F18		PRT SCREEN	E0 2A E0 37	E0 B7 E0 AA

Table B-4 Continued

Keyboard Style	ASCII	VT220	Enhanced PC	Hexadecimal Scan Codes	
				PC	Term Mode
				DN	UP
F16		F17	SCROLL LOCK	46	C6
LEFT SHIFT		LEFT/RIGHT SHIFT	LEFT SHIFT	2A	AA
RIGHT SHIFT			RIGHT SHIFT	36	B6
SPACEBAR		SPACEBAR	SPACEBAR	39	B9
SEND <sup>2</sup>		F18 <sup>2</sup>	PRT SCREEN <sup>2</sup>	54	D4
TAB		TAB	TAB→	0F	8F
-kpd		-kpd	-kpd	4A	CA
,kpd		,kpd	+kpd	4E	CE
CLR LINE		PF3	/kpd	E0 35	E0 B5
.kpd (DEL) <sup>3</sup> DEL		.kpd (REMOVE) <sup>3</sup> REMOVE	. DELkpd (DELETE) <sup>3</sup> DELETE	E0 53 E0 2A E0 53	D3 E0 D3 E0 D3 E0 AA
0kpd (INS CHAR) <sup>3</sup> INS CHAR		0kpd (INSERT HERE) <sup>3</sup> INSERT HERE	0 INSkpd (INSERT) <sup>3</sup> INSERT	E0 52 E0 2A E0 52	D2 E0 D2 E0 D2 E0 AA
1kpd (DEL CHAR) <sup>3</sup> DEL CHAR		1kpd (PF2) <sup>3</sup> PF2	1 ENDkpd (END) <sup>3</sup> END	E0 4F E0 2A E0 4F	CF E0 CF E0 CF E0 AA
2kpd (▼) <sup>3</sup> ▼		2kpd (▼) <sup>3</sup> ▼	2 ↓kpd (↓) <sup>3</sup> ↓	E0 50 E0 2A E0 50	D0 E0 D0 E0 D0 E0 AA
3kpd (PAGE NEXT) <sup>3</sup> PAGE NEXT		3kpd (NEXT SCRN) <sup>3</sup> NEXT SCRN	3 PG DNkpd (PAGE DOWN) <sup>3</sup> PAGE DOWN	E0 51 E0 2A E0 51	D1 E0 D1 E0 D1 E0 AA
4kpd (◀) <sup>3</sup> ◀		4kpd (◀) <sup>3</sup> ◀	4 ←kpd (↔) <sup>3</sup> ↔	E0 4B E0 2A E0 4B	CB E0 CB E0 CB E0 AA

1. Toggles NUM LOCK status and NUM indicator on status line. You can press this key simultaneously with the CTRL key to synchronize the terminal with your application program's NUM LOCK status.

2. With the corner key (FUNC1, COMPOSE, or ALT) pressed simultaneously.

3. The key in parentheses sends the indicated code when NUM LOCK is off; the second, longer code is sent when NUM LOCK is on.

Table B-4 Continued

Keyboard Style			Hexadecimal Scan Codes		
ASCII	VT220	Enhanced PC	PC	Term	Mode
			DN	UP	
5 <sup>kpd</sup>	5 <sup>kpd</sup>	5 <sup>kpd</sup>		4C	CC
6 <sup>kpd</sup> (►) <sup>3</sup>	6 <sup>kpd</sup> (►) <sup>3</sup>	6 → <sup>kpd</sup> (→) <sup>3</sup>		4D E0 4D	CD E0 CD
►	►	→	E0 2A	E0 4D	E0 CD E0 AA
7 <sup>kpd</sup> (HOME) <sup>3</sup>	7 <sup>kpd</sup> (DO) <sup>3</sup>	7 HOME <sup>kpd</sup> (HOME) <sup>3</sup>		47 E0 47	C7 E0 C7
HOME	DO	HOME	E0 2A	E0 47	E0 C7 E0 AA
8 <sup>kpd</sup> (▲) <sup>3</sup>	8 <sup>kpd</sup> (▲) <sup>3</sup>	8 ↑ <sup>kpd</sup> (↑) <sup>3</sup>		48 E0 48	C8 E0 C8
▲	▲	↑	E0 2A	E0 48	E0 C8 E0 AA
9 <sup>kpd</sup> (F14) <sup>3</sup>	9 <sup>kpd</sup> (PREV SCRN) <sup>3</sup>	9 PG UP <sup>kpd</sup> (PAGE UP) <sup>3</sup>		49 E0 49	C9 E0 C9
F14	PREV SCRN	PAGE UP	E0 2A	E0 49	E0 C9 E0 AA
F13	F13			59	D9

Table B-5 Function Key Default Codes

Key	Native <sup>1</sup>	ADDS VP	Key	Native <sup>1</sup>	ADDS VP
F1	SOH @ CR	STX 1	F13	SOH L CR	STX =
F2	SOH A CR	STX 2	F14	SOH M CR	STX >
F3	SOH B CR	STX 3	F15 <sup>2</sup>	SOH N CR	STX ?
F4	SOH C CR	STX 4	F16 <sup>3</sup>	SOH O CR	STX @
F5	SOH D CR	STX 5	F17	SOH P CR	STX A
F6	SOH E CR	STX 6	F18	SOH Q CR	STX B
F7	SOH F CR	STX 7	F19	SOH R CR	STX C
F8	SOH G CR	STX 8	F20	SOH S CR	STX D
F9	SOH H CR	STX 9	SHIFT F1	SOH ' CR	STX !
F10	SOH I CR	STX :	SHIFT F2	SOH a CR	STX "
F11	SOH J CR	STX ;	SHIFT F3	SOH b CR	STX #
F12	SOH K CR	STX <	SHIFT F4	SOH c CR	STX \$

1. Codes also recognized in ADM 31, HZ 1500, and TVI 910+, 920, 925, and 950 modes.

2. HELP key on the VT220-style keyboard.

3. DO key on the VT220-style keyboard.

**Table B-5 Continued**

Key	Native <sup>1</sup>	ADDS VP	Key	Native <sup>1</sup>	ADDS VP
SHIFT F5	SOH d CR	STX %	SHIFT F13	SOH 1 CR	STX -
SHIFT F6	SOH e CR	STX &	SHIFT F14	SOH m CR	STX .
SHIFT F7	SOH f CR	STX '	SHIFT F15 <sup>2</sup>	SOH n CR	STX /
SHIFT F8	SOH g CR	STX (	SHIFT F16 <sup>3</sup>	SOH o CR	STX 0
SHIFT F9	SOH h CR	STX )	SHIFT F17	SOH p CR	STX 1
SHIFT F10	SOH i CR	STX *	SHIFT F18	SOH q CR	STX 2
SHIFT F11	SOH j CR	STX +	SHIFT F19	SOH r CR	STX 3
SHIFT F12	SOH k CR	STX ,	SHIFT F20	SOH s CR	STX 4

**ANSI Key Codes**

These tables list codes generated by special keys in the terminal's ANSI modes (VT100 and VT220 7- or 8-bit), or VT52 mode.

- Table B-6 lists the codes generated by the cursor keys.
- Table B-7 lists the keys used to generate the PF codes for each keyboard.
- Table B-8 lists the codes generated by the numeric keypad keys.
- Table B-9 lists the codes generated by the editing keys for the VT220-, ASCII-, and Enhanced PC-style keyboards.
- Table B-10 lists the default codes for the function keys.

**Table B-6 Cursor Key Codes**

Key	Mode	VT220	VT220	VT100	VT52
		7-Bit	8-Bit		
▲	Normal	ESC [ A	CSI A	ESC [ A	ESC A
	Application	ESC O A	SS3 A	ESC O A	*
▼	Normal	ESC [ B	CSI B	ESC [ B	ESC B
	Application	ESC O B	SS3 B	ESC O B	*
►	Normal	ESC [ C	CSI C	ESC [ C	ESC C
	Application	ESC O C	SS3 C	ESC O C	*
◀	Normal	ESC [ D	CSI D	ESC [ D	ESC D
	Application	ESC O D	SS3 D	ESC O D	*

\* Application mode is not available in VT52 mode.

**Table B-7 Simulated PF-Key Codes**

Keyboard Style				Enhanced PC
Function Codes*	VT100	VT52	VT220	
ESC O P	ESC P		PF1	INS CHAR/LINE
ESC O Q	ESC Q		PF2	DEL CHAR/LINE
ESC O R	ESC R		PF3	CLR LINE/SCRN
ESC O S	ESC S		PF4	REPL/INS

\* The codes output are the same if the key is shifted or unshifted.

**Table B-8 Numeric Keypad Codes<sup>1</sup>**

Key	VT220 7-Bit	VT220 8-Bit	VT100	VT52
PF1	ESC O P	SS3 P	ESC O P	ESC P
PF2	ESC O Q	SS3 Q	ESC O Q	ESC Q
PF3	ESC O R	SS3 R	ESC O R	ESC R
PF4	ESC O S	SS3 S	ESC O S	ESC S
-	ESC O m	SS3 m	ESC O m	ESC ? m
*2	ESC O 1	SS3 1	ESC O 1	ESC ? 1
,	ESC O 1	SS3 1	ESC O 1	ESC ? 1
.	ESC O n	SS3 n	ESC O n	ESC ? n
0	ESC O p	SS3 p	ESC O p	ESC ? p
1	ESC O q	SS3 q	ESC O q	ESC ? q
2	ESC O r	SS3 r	ESC O r	ESC ? r
3	ESC O s	SS3 s	ESC O s	ESC ? s
4	ESC O t	SS3 t	ESC O t	ESC ? t
5	ESC O u	SS3 u	ESC O u	ESC ? u
6	ESC O v	SS3 v	ESC O v	ESC ? v
7	ESC O w	SS3 w	ESC O w	ESC ? w
8	ESC O x	SS3 x	ESC O x	ESC ? x
9	ESC O y	SS3 y	ESC O y	ESC ? y
ENTER <sup>4</sup>	ESC O M	SS3 M	ESC O M	ESC ? M

1. Codes apply when the keypad is set to application mode; in numeric mode, these keys generate the appropriate code for the character on the keycap.

2. Enhanced PC-style keyboard only.

3. ASCII and VT220 keyboards only.

4. In numeric mode, ENTER sends a carriage return code (CR or CRLF).

Table B-9 Editing and Special Key Codes<sup>1</sup>

Key	VT220 7-Bit	VT220 8-Bit	VT100	VT52
<b>VT220-Style Keyboard</b>				
BLOCK (F4)	Local <sup>2</sup>	Same	Same	Same
BREAK (F5)	Local <sup>3</sup>	Same	Same	Same
SHIFT BREAK (F5)	Local <sup>4</sup>	Same	Same	Same
CTRL BREAK (F5)	Local <sup>5</sup>	Same	Same	Same
▲	ESC [ A	CSI A	ESC [ A	ESC A
▼	ESC [ B	CSI B	ESC [ B	ESC B
►	ESC [ C	CSI C	ESC [ C	ESC C
◀	ESC [ D	CSI D	ESC [ D	ESC D
✖	DEL or BS <sup>6</sup>	Same	Same	Same
SHIFT ✖	CAN or DEL <sup>6</sup>	Same	Same	Same
ENTER	CTRL M <sup>7</sup>	Same	Same	Same
FIND	ESC [ 1 ~	CSI 1 ~	None	None
HOLD SCREEN (F1)	Local <sup>8</sup>	Same	Same	Same
INSERT HERE	ESC [ 2 ~ <sup>9</sup>	CSI 2 ~	None	None
NEXT SCRN	ESC [ 6 ~ <sup>10</sup>	CSI 6 ~	None	None
PREV SCRN	ESC [ 5 ~ <sup>11</sup>	CSI 5 ~	None	None
PRINT SCREEN (F2)	Local <sup>12</sup>	Same	Same	Same
REMOVE	ESC [ 3 ~ <sup>13</sup>	CSI 3 ~	None	None
RESET (SHIFT F3)	Local <sup>14</sup>	Same	Same	Same
RETURN	CTRL M <sup>15</sup>	Same	Same	Same

1. Codes for cursor and numeric keypad keys apply only in numeric mode.
2. Toggles the terminal in and out of block mode.
3. Sends break to DATA port. Length depends on BREAK parameter selection in setup mode.
4. Sends two-second disconnect break to DATA port.
5. Sends the answerback message.
6. Action or code depends on DEL KEY parameter selection in setup mode.
7. Sends CTRL M, or CTRL M CTRL J, or CTRL I depending on ENTER field selection in setup.
8. Toggles data communications on and off.
9. If block mode is on, toggles the terminal in and out of insert mode.
10. If block mode is on, clears from the cursor position to the end of the screen.
11. If block mode is on, homes the cursor and clears the screen. Pressed with CTRL, the cursor is homed and the screen cleared regardless of block mode.
12. Sends the contents of the screen to the PRINTER port. Pressed with CTRL or SHIFT, toggles copy print mode on and off.
13. If block mode is on, deletes the character at the cursor and moves the characters to the right one position left.
14. Performs a terminal soft (modes) reset. Pressed with CTRL and SHIFT, performs a hard (power-on) reset.
15. Sends CTRL M, or CTRL M CTRL J, or CTRL I depending on RETURN field selection in setup.

Table B-9 Continued

Key	VT220 7-Bit	VT220 8-Bit	VT100	VT52
SELECT	ESC [ 4 ~	CSI 4 ~	None	None
SEND (SHIFT F4)	Local <sup>16</sup>	Same	Same	Same
SETUP (F3)	Local <sup>17</sup>	Same	Same	Same
TAB	CTRL I	Same	Same	Same
SHIFT TAB	ESC [ Z	CSI Z	ESC [ z	CTRL I
<b>ASCII Keyboard</b>				
BACKSPACE	CTRL H <sup>3</sup>	Same	Same	Same
BREAK (F5)	Local <sup>9</sup>	Same	Same	Same
SHIFT BREAK	Local <sup>4</sup>	Same	Same	Same
CTRL BREAK	Local <sup>5</sup>	Same	Same	Same
CTRL SHIFT BREAK	Local <sup>2</sup>			
CLR LINE/SCRN	ESC O R	SS3 R	ESC O R	ESC R
▲	ESC [ A	CSI A	ESC [ A	ESC A
▼	ESC [ B	CSI B	ESC [ B	ESC B
►	ESC [ C	CSI C	ESC [ C	ESC C
◀	ESC [ D	CSI D	ESC [ D	ESC D
DEL	DEL or BS <sup>6</sup>	Same	Same	Same
SHIFT DEL	CAN or DEL <sup>6</sup>	Same	Same	Same
DEL CHAR/LINE	ESC O Q	SS3 Q	ESC O Q	ESC Q
ENTER	CTRL M <sup>7</sup>	Same	Same	Same
ESC	CTRL [	Same	Same	Same
FUNCT	Local <sup>8</sup>	Same	Same	Same
HOME	ESC [ H	CSI H	ESC [ H	ESC H
CTRL SHIFT HOME	Local <sup>18</sup>	Same	Same	Same
INS/REPL	ESC O S	SS3 S	ESC O S	ESC S
INS CHAR/LINE	ESC O P	SS3 P	ESC O P	ESC P
PAGE NEXT	ESC [ U	CSI U	ESC [ U	None
PAGE PREV	ESC [ V	CSI V	ESC [ V	None
PRINT	Local <sup>12</sup>	Same	Same	Same
RETURN	CTRL M <sup>13</sup>	Same	Same	Same
SEND	Local <sup>15</sup>	Same	Same	Same

16. Sends the cursor line to the data port.

17. Puts terminal in setup mode. Pressed with CTRL, performs a hard (power-on reset).

18. Homes cursor and clears screen.

Table B-9 Continued

Key	VT220 7-Bit	VT220 8-Bit	VT100	VT52
SETUP	Local <sup>14</sup>	Same	Same	Same
SHIFT SETUP	Local <sup>17</sup>	Same	Same	Same
TAB	CTRL I	Same	Same	Same
SHIFT TAB	ESC [ Z	CSI Z	ESC [ Z	CTRL I
<b>Enhanced PC-Style Keyboard</b>				
←BACKSPACE	CTRL H	Same	Same	Same
PAUSE	Local <sup>4</sup>	Same	Same	Same
SHIFT PAUSE	Local <sup>5</sup>			
CTRL PAUSE	Local <sup>9</sup>	Same	Same	Same
▲	ESC [ A	CSI A	ESC [ A	ESC A
▼	ESC [ B	CSI B	ESC [ B	ESC B
►	ESC [ C	CSI C	ESC [ C	ESC C
◀	ESC [ D	CSI D	ESC [ D	ESC D
DEL	DEL or BS <sup>6</sup>	Same	Same	Same
SHIFT DEL	CAN or DEL <sup>6</sup>	Same	Same	Same
ENTER	CTRL M <sup>7</sup>	Same	Same	Same
ESC	CTRL [	Same	Same	Same
HOME	ESC [ H	CSI H	ESC [ H	ESC H
CTRL SHIFT HOME	Local <sup>18</sup>	Same	Same	Same
SCROLL LOCK	Local <sup>8</sup>	Same	Same	Same
SELECT	Local <sup>19</sup>	Same	Same	Same
SHIFT SELECT	Local <sup>17</sup>			
TAB →	CTRL I	Same	Same	Same
SHIFT TAB →	ESC [ Z	CSI Z	ESC [ Z	CTRL I

19. Pressed with CTRL, performs a soft (modes) reset.

**Table B-10 Function Key Default Codes<sup>1</sup>**

Key	Keyboard Style		
	VT220 <sup>2</sup>	ASCII	Enhanced PC
F1 (HOLD SCREEN)	Local	ESC [ ? 5 i <sup>3</sup>	PF1 <sup>4</sup>
SHIFT F1	Local	ESC [ 5 i <sup>5</sup>	PF1
F2 (PRINT SCREEN)	Local	ESC [ ? 3 i	PF2
SHIFT F2	Local	ESC [ ? 1 i	PF2
F3 (SETUP/RESET)	Local	ESC [ 2 i	PF3
SHIFT F3	Local	ESC [ 0 i	PF3
F4 (BLOCK/SEND)	Local	ESC [ @	PF4
SHIFT F4	Local	ESC [ L	PF4
F5 (BREAK)	Local	ESC [ M	Same
SHIFT F5	Local	ESC [ K	Same
F6	ESC [ 17 ~	Same	Same
SHIFT F6	None	ESC [ 31 ~	Same
F7	ESC [ 18 ~	Same	Same
SHIFT F7	None	ESC [ 32 ~	Same
F8	ESC [ 19 ~	Same	Same
SHIFT F8	None	ESC [ 33 ~	Same
F9	ESC [ 20 ~	Same	Same
SHIFT F9	None	ESC [ 34 ~	Same
F10	ESC [ 21 ~	Same	Same
SHIFT F10	None	ESC [ 35 ~	Same
F11 (ESC) <sup>6</sup>	ESC [ 23 ~	Same	Same
SHIFT F11	None	ESC [ 1 ~	Same
F12 (BS) <sup>7</sup>	ESC [ 24 ~	Same	Same
SHIFT F12	None	ESC [ 2 ~	Same
F13 (LF) <sup>8</sup>	ESC [ 25 ~	Same	
SHIFT F13	None	ESC [ 3 ~	
F14 (HOME) <sup>9</sup>	ESC [ 26 ~	Same	
SHIFT F14	None	ESC [ 4 ~	

1. These default codes apply only before the function keys are redefined or after any redefinition has been cleared.
2. On the VT220-style keyboard, F1 through F5 have local functions—see Table B-10.
3. With auxiliary print mode off, Sends ESC [ ? 4 i if auxiliary print mode is on.
4. On the Enhanced PC-style keyboard, function keys F1 through F4, shifted and unshifted, send PF key codes (see Table B-8).
5. With transparent print mode off, Sends ESC [ 4 i if transparent print mode is on.
6. In VT52 and VT100 modes, the default is ESC (CTRL I).
7. In VT52 and VT100 modes, the default is BS (CTRL H).
8. In VT52 and VT100 modes, the default is LF (CTRL J).
9. In VT52 mode, the default is ESC H. In VT100 mode, the default is ESC [ H.

Table B-10 Continued

Key	Keyboard Style		
	VT220 <sup>2</sup>	ASCII	Enhanced PC
F15 (HELP)	ESC [ 28 ~	Same	
SHIFT F15	None	ESC [ 5 ~	
F16 (DO)	ESC [ 29 ~	Same	
SHIFT F16	None	ESC [ 6 ~	
F17	ESC [ 31 ~		
SHIFT F17	None		
F18	ESC [ 32 ~		
SHIFT F18	None		
F19	ESC [ 33 ~		
SHIFT F19	None		
F20	ESC [ 34 ~		
SHIFT F20	None		

## Appendix

**C****Graphics Modes Command Guide**

Appendix C describes commands for Tektronix 4010/4014 mode, Hercules, CGA, and Alpha graphics modes.

**Tektronix 4010/4014 Mode**

Table C-1 summarizes the control codes and escape sequences recognized by the terminal in 4010/4014 mode.

**Table C-1 4010/4014 Command Summary**

Sequence	CTRL Code	Description
BEL	G	Sounds bell, clear bypass
BS	H	Moves cursor left
HT	I	Moves cursor right
LF	J	Linefeed, clears bypass
VT	K	Moves cursor up
CR	M	Carriage return, resets to alpha mode, clears bypass, cancels crosshair cursor
FS	\	Sets point plot mode
GS	]	Sets graph mode, directs beam without draw (dark vector)
RS	-	Sets incremental plot mode
US		Resets to alpha mode, clears bypass
ESC ENQ	È	Sends terminal status, sets bypass, sends beam or cursor address, resets to alpha mode
ESC BEL	G	Same as BEL
ESC LF	J	Carriage return, resets to alpha mode, clears bypass, cancels crosshair cursor
ESC FF	L	Sets alpha mode, erases screen, homes cursor, clears bypass
ESC CR	M	Ignores CR in alpha mode
ESC CAN	X	Sets bypass condition
ESC SUB	Z	Sets GIN mode (displays crosshair cursor, sets bypass)
ESC GS	]	Same as GS
ESC RS	-	Same as RS
ESC US	-	Same as US
ESC 8		Selects 74 characters per line

Table C-1 Continued

Sequence	CTRL Code	Description
ESC 9		Selects 81 characters per line
ESC :		Selects 121 characters per line
ESC ;		Selects 133 characters per line
ESC [ ? 38 1		Selects VT200 7-bit mode
ESC ,		Selects solid line
ESC a		Selects dotted line
ESC b		Selects dot-dashed line
ESC c		Selects short dashed line
ESC d		Selects long dashed line
ESC e		Selects solid line
ESC f		Selects solid line
ESC g		Selects solid line
ESC h		Selects solid line
ESC i		Selects dotted line
ESC j		Selects dot-dashed line
ESC k		Selects short dashed line
ESC l		Selects long dashed line
ESC m		Selects solid line
ESC n		Selects solid line
ESC o		Selects solid line

**Hercules and CGA Modes**

In both of these modes, display bytes 0-92 and 98-FF are written directly to the screen. Display bytes 93-97 are command bytes. To display the byte corresponding to the command range 93-97H, that byte must be followed by a null. Table C-2 summarizes the command format recognized by both modes.

Table C-2 Hercules and CGA Command Format Summary

Command Byte Format	Function
93 + MSB + LSB	Sets the video RAM address for the current page. Note that the MSB is always set high.
94 + 7-bit signed byte	Indicates the number of location to move the current video address offset.
95 + 1 byte	Creates a horizontal line. The byte is in the 2 through 255 range, indicating the number of consecutive words in the line.
95 + 01 + MSB + LSB	Alternate format to create a horizontal line where 01 is a long function and MSB + LSB indicates the number of words in the line.
96	Replaces leading NUL in character mode control sequences when in block (Hercules) mode.

**Table C-2 Continued**

Command Byte Format	Function
97 + 1 byte	Creates a vertical line. The byte is in the 2 through 255 range, indicating the number of consecutive words in the line.
97 + 01 + MSB + LSB	Alternate format to create a vertical line where 01 is a long function and MSB + LSB indicates the number of words in the line.

**Alpha Mode**

Within PC Graphics, there is a text mode. In this mode, bytes 1 to FF, when received by the terminal, are treated as standard ASCII text. Byte 00H (Null) is the leading byte for a set of control commands in this mode. Table C-3 summarizes those commands.

**Table C-3 Alpha Mode  
Command Format Summary**

Command Byte Format	Function
Null + 0000 <i>aaaa</i> + <i>aaaa aaaa</i>	Sets a new cursor position where Binary <i>a</i> is the offset of the cursor in the text display
Null + 20H + <i>ttts ssss</i> + <i>ttte eeee</i>	Sets cursor attribute where Binary <i>s</i> —Starts cursor overlay scan line Binary <i>e</i> —Ends cursor overlay scan line Binary <i>t</i> —Controls cursor attribute: Bit 7—No function Bit 6—Cursor display, on or off Bit 5—Cursor blink, on or off Bits 4 through 0—Start/stop cursor scan
Null + 40H	Clears display
Null + 41H	Clears from cursor position to end of line
Null + 42H	Sounds bell
Null + 43H	Scrolls page and inserts blank row at the bottom of the page

Table C-3 Continued

Command Byte Format	Function										
Null + 011p <i>pppp</i> + <i>dddd dddd</i>	<p>Controls port I/O. If <i>p pppp</i> equals 4, then this command writes to the control register of the port where the data portion of the command (<i>dddd dddd</i>) has this format:</p> <ul style="list-style-type: none"> <li>Bit 7—Page select (only page 0 supported)</li> <li>Bit 6—Not used</li> <li>Bit 5—Enables text blinker</li> <li>Bit 4—Not used</li> <li>Bit 3—Screen enable</li> <li>Bit 2—Not used</li> <li>Bit 1—Enters graphics/clears screen</li> <li>Bit 0—Clear, Hercules format set, CGA format</li> </ul>										
Null + 80H + <i>aaaa aaaa</i>	<p>Sets new character attributes where <i>aaaa aaaa</i> designates the following attributes:</p> <table> <tr><td>Attribute code</td><td>7 6 5 4 3 2 1 0</td></tr> <tr><td>Blank</td><td>B 0 0 0 I 0 0 0</td></tr> <tr><td>Underline</td><td>B 0 0 0 I 0 0 1</td></tr> <tr><td>Normal display</td><td>B 0 0 0 I 1 1 1</td></tr> <tr><td>Reverse video</td><td>B 1 1 1 I 0 0 0</td></tr> </table> <p>where</p> <ul style="list-style-type: none"> <li>I = 0—Sets normal text</li> <li>I = 1—Sets bold text</li> <li>B = 1—Sets a blinking character if the text blinker is enabled</li> <li>B = 1—Sets a bold background if the text blinker is not enabled</li> </ul>	Attribute code	7 6 5 4 3 2 1 0	Blank	B 0 0 0 I 0 0 0	Underline	B 0 0 0 I 0 0 1	Normal display	B 0 0 0 I 1 1 1	Reverse video	B 1 1 1 I 0 0 0
Attribute code	7 6 5 4 3 2 1 0										
Blank	B 0 0 0 I 0 0 0										
Underline	B 0 0 0 I 0 0 1										
Normal display	B 0 0 0 I 1 1 1										
Reverse video	B 1 1 1 I 0 0 0										
Null + 11tn <i>nnnn</i> + <i>rrrr rrrr</i> + <i>cccc cccc</i> + <i>RRRR RRRR</i> + <i>CCCC CCCC</i> + <i>aaaa aaaa</i>	<p>Scrolls the display where</p> <ul style="list-style-type: none"> <li><i>t</i>—Sets the scroll direction (1 = up, 0 = down)</li> <li><i>n nnnn</i>—Defines the number of lines to scroll up or down</li> <li><i>rrrr rrrr</i>—Address of the upper left row</li> <li><i>cccc cccc</i>—Not used</li> <li><i>RRRR RRRR</i>—Address of the lower right row</li> <li><i>CCCC CCCC</i>—Not used</li> <li><i>aaaa aaaa</i>—Attribute of new lines inserted at the top or bottom</li> </ul>										

## Appendix



# Local Keyboard Command Guide

Table D-1 Native Mode Local Keyboard Commands

Command	Keyboard Style WY-99GT ASCII	VT220	Enhanced PC
Toggle SHIFT LOCK on/off	CAPS LOCK	CAPS LOCK	CAPS LOCK
Toggle NUM LOCK on/off	F15	PF1	NUM LOCK
Hold data on screen <sup>1</sup>	FUNCT	HOLD SCREEN (F1)	SCROLL LOCK
Put terminal in setup mode	SHIFT SETUP	SETUP	SHIFT SELECT
Partially reset terminal, including communication; unlock keyboard, turn off all print modes	SETUP	SHIFT SETUP	SELECT
Send break	BREAK	BREAK (F5)	BREAK
Toggle between block/full-duplex modes	SHIFT BREAK	BLOCK (F4)	SHIFT BREAK
Print screen formatted	PRINT	PRINT SCREEN	PRINT SCREEN
Select other port as data port	CTRL BREAK		
Turn auxiliary print mode on/off	CTRL PRINT	CTRL PRINT SCRN	SHIFT SYS REQ
Turn monitor mode on/off	CTRL SHIFT <i>1kpd</i>	CTRL SHIFT <i>1kpd</i>	CTRL SHIFT <i>1kpd</i>
Turn keyclick on/off	SHIFT ENTER	SHIFT ENTER	SHIFT ENTER
Turn status line display on/off	CTRL SHIFT ▲	CTRL SHIFT ▲	CTRL ▲
Turn on instant screen saver <sup>2</sup>	CTRL CLR SCRN		
Put terminal in WyseWorks	CTRL CAPS LOCK	CTRL CAPS LOCK	CTRL CAPS LOCK
Speed scrolling rate	CTRL SHIFT ▲	CTRL SHIFT ▲	CTRL SHIFT ↑
Slow scrolling rate	CTRL SHIFT ▼	CTRL SHIFT ▼	CTRL SHIFT ↓
Home cursor and clear page	CTRL SHIFT HOME		CTRL SHIFT HOME
Display page 0	CTRL 0 <i>kpd</i>	CTRL 0 <i>kpd</i>	CTRL 0 <i>kpd</i>
Display page 1	CTRL 1 <i>kpd</i>	CTRL 1 <i>kpd</i>	CTRL 1 <i>kpd</i>
Display next page (or activate other window <sup>3</sup> )	CTRL NEXT PAGE	NEXT SCRN	CTRL PAGE DOWN

1. When CORNER KEY setup parameter is set to HOLD and the data port has handshaking enabled

2. SCRN SAVER parameter must be on

3. If screen is split

**Table D-1 Continued**

Command	Keyboard Style WY-99GT ASCII	VT220	Enhanced PC
Display previous page (or activate other window <sup>4</sup> )	CTRL PREV PAGE	PREV SCRN	CTRL PAGE UP
Toggle split screen/full screen format <sup>4</sup>	CTRL SHIFT - <i>kpd</i>	CTRL SHIFT - <i>kpd</i>	CTRL SHIFT - <i>kpd</i>
Raise horizontal split and adjust display	CTRL - <i>kpd</i>	CTRL - <i>kpd</i>	
Lower horizontal split and adjust display	CTRL , <i>kpd</i>	CTRL , <i>kpd</i>	
Roll active window up in page <sup>4</sup>	CTRL ▲	CTRL ▲	
Roll active window down in page <sup>4</sup>	CTRL ▼	CTRL ▼	

4. Splits screen at line 12

## Appendix

# E Installing a Mouse

This appendix contains instructions to connect a Microsoft Mouse to either the MODEM or AUX port on the rear panel of the terminal.

- Note** In Tektronix mode, mouse data positions the cursor on the terminal screen. In all other modes, your application must understand data sent from the mouse if you choose to use one.

---

**Installation**

If your application program requires a mouse, you can install one following these instructions:

- 1 Find the PRT RCV field in setup menu F3. Set it for MOUSE.
- 2 Find the DATA/PRINTER field in setup menu F4. Assign the printer function to the MODEM or the AUX port.
- 3 Set the following configuration parameters for the port you have chosen to perform the printer function:
  - Data/Stop Bits 8/1
  - Baud Rate 1200
  - Handshaking None
  - Parity None
- 4 Attach the mouse according to the instruction provided by the manufacturer.

When you leave setup, look for the <PRT (printer receive) symbol above the status line. This symbol tells you that the mouse is installed and ready to generate data.

## Appendix

# F ASCII Command Guide

## Commands Supported in ASCII Personalities

The following tables list all the ASCII commands recognized by the terminal. Table F-1 lists all commands recognized in native mode, the WY-50+, the ADM 31, the ADDS Viewpoint A2, and the Hazeltine 1500 terminals. Table F-2 lists all commands recognized in native mode and the TeleVideo family terminals. Table F-3 lists commands recognized in PC terminal mode.

In Tables F-1 and F-2, columns other than the native mode column show the support for the command in other ASCII personalities according to the following notations:

- Same = Same as native code (code is native to other terminal also)
- Wyse = Wyse enhancement—code not native to other terminal, but always executed
- ENH = Wyse enhancement—code not native to other terminal, but executed in enhanced mode

A blank in any column indicates that the command is not supported. Variables are shown in italics. Their values are given at the end of the tables (page F-18) according to the reference numbers in brackets after the command description, e.g., [21].

**Table F-1 Commands Supported in Native and Miscellaneous ASCII Personalities**

Function	Command			
	Native Mode	WY-50+ ADM 31	ADDS VP A2	HZ 1500
<b>Monitor Mode</b>				
Monitor mode on	ESC U	Same		ENH
Monitor mode off	ESC u or ESC X	Same		ENH

**Table F-1 Continued****Command**

Function	Native Mode	WY-50+ ADM 31	ADDS VP A2	HZ 1500
<b>Selecting Personalities</b>				
Enhance mode off	ESC ~ SPACE	Same	ENH	Wyse
Enhance mode on	ESC ~ !	Same		
Select WY-50+ mode	ESC ~ "	Same	ENH	Wyse
Select TVI 910+ mode	ESC ~ #	Same	ENH	Wyse
Select TVI 925 mode	ESC ~ \$	Same	ENH	Wyse
Select ADDS VP A2 mode	ESC ~ %	Same	ENH	Wyse
Select HZ 1500 mode	ESC ~ &	Same	ENH	Wyse
Select TVI 912/920 mode	ESC ~ '	Same	ENH	Wyse
Select TVI 950 mode	ESC ~ (	Same	ENH	Wyse
Select ADM 31 mode	ESC ~ +	Same	ENH	Wyse
Select Native mode	ESC ~ 4	Same	ENH	Wyse
Select PC Terminal	ESC ~ 5	Same	ENH	Wyse
Select PC Graphics	ESC ~ ?	Same	ENH	Wyse
Select VT52 mode	ESC ~ 6	Same	ENH	Wyse
Select VT100 mode	ESC ~ ;	Same	ENH	Wyse
Select VT220 7-bit mode	ESC ~ <	Same	ENH	Wyse
Select VT220 8-bit mode	ESC ~ =	Same	ENH	Wyse
Select TEK 4010/4014 mode	ESC ~ >	Same	ENH	Wyse
<b>Communicating with the Computer</b>				
Enable transmission	CTRL Q	Same	Same	
Stop transmission	CTRL S	Same	Same	
Send ACK (if ACK mode on)	CTRL E	Same		
ACK mode off	ESC e 6	Same		Wyse
ACK mode on	ESC e 7	Same		Wyse
Full-duplex mode on	ESC C ESC D F	Same		ENH
Half-duplex mode on	ESC C ESC D H	Same		ENH
Block mode on	ESC B	Same		ENH
Half-duplex block mode on	ESC D H ESC B	Same		ENH
Select MODEM port for data communications	ESC e 8	Same		
Select AUX port for data communications	ESC e 9	Same		
Set MODEM port operating parameters [1,2,3,4]	ESC c 0 <i>baud</i> <i>stop parity word</i>	Same		ENH
Set AUX port operating parameters [1,2,3,4]	ESC c 1 <i>baud</i> <i>stop parity word</i>	Same		ENH

Table F-1 Continued

Function	Command	WY-50+ ADM 31	ADDS VP A2	HZ 1500
Set MODEM port receive handshaking [5]	ESC c 2 <i>hndshk</i>	Same		ENH
Set AUX port receive handshaking [5]	ESC c 3 <i>hndshk</i>	Same		ENH
Set MODEM port transmit handshaking [5]	ESC c 4 <i>hndshk</i>	Same		ENH
Set AUX port transmit handshaking	ESC c 5 <i>hndshk</i>	Same		ENH
Set maximum data transmission speed [6]	ESC c 6 <i>max</i>	Same		Wyse
Send terminal ID	ESC SPACE	Same		
Program answerback message [7]	ESC c ; <i>answer</i> CTRL Y	Same		
Send answerback message	ESC c <	Same		
Conceal answerback message	ESC c =	Same		
Answerback mode off	ESC e SPACE	Same		
Answerback mode on	ESC e !	Same		
Load time of day [8,9]	ESC c 8 <i>hh mm</i>	Same		Wyse
<b>Controlling the Terminal and Keyboard</b>				
Local edit mode on	ESC k	Same		ENH
Duplex edit mode on	ESC l	Same		ENH
Restore tabs off	ESC e :	Same		ENH
Restore tabs on	ESC e ;	Same		ENH
Sound bell	CTRL G	Same	Same	Same
Unlock keyboard	CTRL N or ESC "	Same	CTRL B	ENH or -ACK
Lock keyboard	CTRL O or ESC #	Same	CTRL D	ENH or -NAK
Keyclick off	ESC e \$	Same		ENH
Keyclick on	ESC e %	Same		ENH
CAPS LOCK on	ESC e &	Same		ENH
CAPS LOCK off	ESC e '	Same		ENH
Margin bell off	ESC e L	Same		ENH
Set margin bell at cursor position	ESC ' J	Same		ENH
Margin bell on	ESC e M	Same		ENH
Key repeat off	ESC e ,	Same		ENH
Key repeat on	ESC e -	Same		ENH
Define CAPS LOCK key as CAPS LOCK	ESC e T	Same		
Define CAPS LOCK key as REV	ESC e U	Same		

**Table F-1 Continued**

Function	Command	Native Mode	WY-50+ ADM 31	ADDS VP A2	HZ 1500
<b>Redefining the Keys</b>					
Program function key definition [10,11]	ESC z <i>fkey sequence</i> DEL	Same		ENH	ENH
Program key direction and definition [10,11,12,13]	ESC Z <i>dir key sequence</i> DEL	Same			
Read key direction and definition [11,13]	ESC Z - <i>key</i>	Same			
Clear fkey definition [11]	ESC z <i>fkey</i> DEL	Same		ENH	ENH
Set maximum function key transmission speed [6]	ESC c 7 max	Same			
Default all programmable keys	ESC c U	Same			
<b>Screen and Cursor Display</b>					
Screen display off	ESC ' 8	Same		ENH	ENH
Screen display on	ESC ' 9	Same		ENH	ENH
Screen saver off	ESC e P	Same			
Screen saver on	ESC e Q	Same			
Reverse screen	ESC ^ 1	Same		ENH	Wyse
Restore normal screen	ESC ^ 0	Same		ENH	Wyse
Set scrolling speed and type [14]	ESC ' scroll	Same		ENH	ENH
Set cursor display features [15]	ESC ' cursor	Same		ENH	ENH
Cursor display off	ESC ' 0	Same		CTRL W	
Cursor display on	ESC ' 1	Same		CTRL X	
<b>Displaying the Message Fields</b>					
Editing status line on	ESC ' a	Same		ENH	ENH
Standard status line on	ESC ' b	Same		ENH	ENH
Status line off	ESC ' c	Same		ENH	ENH
Program/display computer message on status line [16]	ESC F <i>message</i> CR	Same			ENH
Program computer message on unshifted label line <sup>1</sup> [17]	ESC z ( <i>text</i> CR	Same		ENH	ENH
Program computer message on shifted label line [17]	ESC z ) <i>text</i> CR	Same		ENH	ENH
Turn off unshifted label line	ESC A 11 <sup>1</sup>	Same			ENH
Turn off shifted label line	ESC z DEL	Same		ENH	ENH
Clear unshifted label line	ESC z ( CR	Same		ENH	ENH
Clear shifted label line	ESC z ) CR	Same		ENH	ENH

1. Automatically displayed in native mode; may be hidden by assigning blank attribute (ESC A 1 1)

Table F-1 Continued

Function	Command Native Mode	WY-50+ ADM 31	ADDS VP A2	HZ 1500
Program/display function key label [18,19]	ESC z <i>field label</i> CR	Same	ENH	ENH
Clear function key label [19]	ESC z <i>field</i> CR	Same	ENH	ENH
<b>Defining the Data Area</b>				
Select 80-column display	ESC ' :	Same		
Select 132-column display	ESC ' ;	Same		
Width-change-clear mode off	ESC e .	Same		Wyse
Width-change-clear mode on	ESC e /	Same		Wyse
Display 24 data lines <sup>2</sup>	ESC e (	Same		
Display 25 data lines <sup>2</sup>	ESC e )	Same		
<b>Display Memory/Split Screen</b>				
Page size = 1 x data lines	ESC w G	Same		
Page size = 2 x data lines	ESC w H	Same		
Display previous page	ESC w B or ESC J <sup>3</sup>	Same		
Display next page	ESC w C or ESC K <sup>3</sup>	Same		
Display page 0	ESC w 0	Same		
Display page 1	ESC w 1	Same		
Split screen horizontally (2 pages only) [20]	ESC x A <i>line</i>	Same		
Split screen horizontally (2 pages only) and clear pages [20]	ESC x 1 <i>line</i>	Same		
Split screen horizontally (multiple pages) [20]	ESC x C <i>line</i>	Same		
Split screen horizontally (multiple pages) and clear pages [20]	ESC x 3 <i>line</i>	Same		
Activate upper window	ESC ]	Same		
Activate lower window	ESC }	Same		
Activate other window (or page <sup>3</sup> )	ESC J or ESC K	Same		
Lower horizontal split	ESC x P	Same		
Raise horizontal split	ESC x R	Same		
Roll window up in page	ESC w E	Same		
Roll window down in page	ESC w F	Same		
Redefine screen as one window	ESC x @	Same		
Redefine screen as one window and clear pages	ESC x 0	Same		

2. Screen cleared

3. If screen is not split

**Table F-1 Continued**

Function	Command	WY-50+ ADM 31	ADDS VP A2	HZ 1500
<b>Display Attributes</b>				
Assign display attribute to a message field [21,22]	ESC A <i>n attr</i>	Same		ENH
Assign character display attribute [22]	ESC G <i>attr</i>	Same		ENH
Character attribute mode off	ESC e 0			
Character attribute mode on	ESC e 1			
Page attribute mode on	ESC e 2	Same		
Line attribute mode on	ESC e 3	Same		
Assign write-protected character display attribute [23]	ESC ' wPCA	Same	ESC 0	
Clear unprotected page to display attribute [22]		ESC ! <i>attr</i>	ENH	ENH
Assign line attribute [24]	ESC G <i>lattr</i>	Same		
Set tag protect attribute			CTRL N	
Reset tag protect attribute			CTRL O	
<b>Protecting Data</b>				
Write-protect mode off	ESC (	Same	CTRL O	~ US
Write-protect mode on	ESC )	Same	CTRL N	~ EM
Clear cursor column to write-protected spaces	ESC V	Same		ENH
Protect mode off	ESC '	Same	ENH	ENH
Protect mode on	ESC &	Same	ENH	ENH
<b>Graphics Characters</b>				
Line drawing graphics mode on	ESC H CTRL B	Same		ENH
Line drawing graphics mode off	ESC H CTRL C	Same		ENH
Line drawing display graphics character [25]	ESC H <i>key</i>	Same		ENH
<b>Controlling the Cursor</b>				
Cursor left (backspace)	CTRL H	Same	Same or CTRL U	Same
Cursor right	CTRL L	Same	CTRL F	CTRL P
Cursor up; no scroll	CTRL K	Same	CTRL Z	~ FF
Cursor up; scroll (reverse linefeed)	ESC j	Same	ENH	ENH
Cursor down; no scroll				ENH or ~ VT
Cursor down; scroll (linefeed)	CTRL J	Same	Same	Same
Cursor to start of line	CTRL M	Same	Same	Same
Cursor to start of next line	CTRL _	Same	ENH	ENH

**Table F-1 Continued**

Function	Command	WY-50+ ADM 31	ADDS VP A2	HZ 1500
	Native Mode			
Home cursor	ESC { or CTRL ^	Same	ENH or CTRL A	ENH or ~ DC2
Cursor to specific column			CTRL P <i>col</i>	
Cursor to specific line			CTRL K <i>line</i>	
End-of-line wrap off	ESC d .	Same		
End-of-line wrap on	ESC d /	Same		
Received CRLF mode off	ESC e 4	Same		
Received CRLF mode on	ESC e 5	Same		
Autopage mode off	ESC d *	Same		
Autopage mode on	ESC d +	Same		
Autoscrolling mode off	ESC N	Same		ENH
Autoscrolling mode on	ESC O	Same		ENH
Line lock mode on (lock line at cursor)	ESC ' H	Same		
Line lock mode off	ESC ' I	Same		
Address cursor in 80-column current page [20]	ESC = <i>line col</i>	Same	ENH or ESC Y	ENH or ~ DC1
Address cursor in specific 80-column page [26,20]	ESC w @ <i>page</i> <i>line col</i>	Same	ENH	
Address cursor in specific 80-column window/page <sup>3</sup> [26,20]	ESC - <i>wnd/page</i> <i>line col</i>	Same	ENH	
Address cursor in 80/132-column current page [27,28]	ESC a <i>lll</i> R <i>ccc</i> C	Same	ENH	ENH
Read cursor line and column address in 80-column current page	ESC ?	Same	ENH	~ ENQ
Read 80-column page number and cursor address	ESC w '	Same		
Read 80-column window/page number and cursor address	ESC /	Same		
Read cursor address in 80/132-column page	ESC b	Same		ENH
<b>Editing</b>				
Clear all tab stops	ESC 0	Same		ESC 3
Set tab stop	ESC 1	Same		ENH
Clear tab stop	ESC 2	Same		ENH
Tabulate cursor	ESC i or CTRL I	Same	ENH	
Backtab	ESC I	Same	ENH	ENH
Insert mode on, replace mode off	ESC q	Same	ENH	ENH

**Table F-1 Continued**

Function	Command	Native Mode	WY-50+ ADM 31	ADDS VP A2	HZ 1500
Insert mode off, replace mode on	ESC r	Same	ENH	ENH	
Page edit mode off	ESC e "	Same			
Page edit mode on	ESC e #	Same			
Insert space character	ESC Q	Same	ENH	ENH	
Insert line of spaces	ESC E	Same	ENH	ENH or ~ SUB	
Insert column of nulls	ESC c M				
Delete cursor character	ESC W	Same	ENH	ENH	
Delete cursor line	ESC R	Same	ESC 1	ENH or ~ DC3	
Delete cursor column	ESC c J				
<b>Clearing Data</b>					
Clear page to nulls	ESC *	Same	ENH	ENH	
Clear page to spaces	ESC +	Same	ENH or CTRL L	ENH or ~ FS	
Clear page to write-protected spaces	ESC ,	Same	ENH	ENH or ~ ETB	
Clear unprotected page to spaces	ESC ; or CTRL Z	Same	ESC ;	ENH or ~ GS	
Clear unprotected page to nulls	ESC :	Same	ENH	ENH	
Clear unprotected page to a specific character [29]	ESC . char	Same	ENH	ENH	
Clear unprotected page to display attribute [22]		ESC ! attr	ENH	ENH	
Clear unprotected page to spaces from cursor	ESC Y	Same	ESC k	ENH or ~CAN	
Clear unprotected page to nulls from cursor	ESC y	Same	ENH	ENH	
Clear unprotected page foreground to spaces	ESC c P	Same			
Clear unprotected page foreground to nulls	ESC c Q	Same			
Clear unprotected line to spaces from cursor	ESC T	Same	ESC K	ENH or ~SI	
Clear unprotected line to nulls from cursor	ESC t	Same			ENH
Clear unprotected to end of line with spaces	ESC c O	Same			
Clear unprotected to end of line with nulls	ESC c L	Same			
Clear unprotected line foreground to spaces	ESC c R	Same			
Clear unprotected line foreground to nulls	ESC c S	Same			
Clear unprotected column to nulls	ESC c K				
Clear unprotected column to specific character [29]	ESC c I char				

**Table F-1 Continued**

Function	Command	WY-50+ ADM 31	ADDS VP A2	HZ 1500
<b>Sending Data</b>				
Begin print/send at top of page	ESC d '	Same		
Begin print/send at top of screen	ESC d &	Same		
Send cursor character	ESC M	Same		ENH
Send line then cursor	ESC 6	Same		ENH
Send unprotected line through cursor	ESC 4	Same		ENH
Send page through cursor	ESC 7	Same	ENH	ENH
Send unprotected page through cursor	ESC 5	Same		ENH
Mark block beginning	ESC 8	Same	ENH	ENH
Mark block end	ESC 9	Same	ENH	ENH
Send entire block	ESC s	Same	ENH	ENH
Send unprotected characters in block	ESC S	Same	ENH	ENH
<b>Print Functions</b>				
Print formatted page	ESC P	Same	ENH	ENH
Print formatted unprotected page	ESC @	Same	ENH	ENH
Print unformatted page	ESC p or ESC L	Same	ESC p	ENH
Auxiliary print mode off	CTRL T	Same	Same	ENH
Auxiliary print mode on	CTRL R	Same	Same	ENH
Transparent print mode off	CTRL T	Same	ESC 4	ENH
Transparent print mode on	ESC d #	Same	ESC 3	ENH
Secondary receive mode off	ESC d SPACE	Same		ENH
Secondary receive mode on	ESC d !	Same		ENH
Bidirectional mode off	ESC d \$	Same		ENH
Bidirectional mode on	ESC d %	Same		ENH
<b>Character Sets</b>				
Select primary character set	ESC c D	Same		
Select secondary character set	ESC c E	Same		
Define primary character set [32]	ESC c B <i>bank</i>	Same		
Define secondary character set [32]	ESC c C <i>bank</i>	Same		
Automatic font loading off	ESC e N	Same		
Automatic font loading on	ESC e O	Same		
Load font bank with predefined character set [32,33]	ESC c @ <i>bank set</i>	Same		
Clear font bank [32]	ESC c ? <i>bank</i>	Same		
Define and load character [32,34,35]	ESC c A <i>bank pp</i> <i>bb...bb</i>	Same		

**Table F-2 Commands Supported in TeleVideo Modes**

<b>Function</b>	<b>Command</b>					
	<b>Native Mode</b>	<b>TeleVideo 910+</b>	<b>920</b>	<b>925</b>	<b>950</b>	
<b>Monitor Mode</b>						
Monitor mode on	ESC U	Same	Wyse	Same	Same	
Monitor mode off	ESC u or ESC X	Same	Wyse	Same	Same	
<b>Selecting Other Personalities</b>						
Enhance mode off	ESC ~ SPACE	ENH	ENH	ENH	ENH	
Enhance mode on	ESC ~ !	ENH	ENH	ENH	ENH	
Select WY-50+ mode	ESC ~ "	Wyse	Wyse	Wyse	Wyse	
Select TVI 910+ mode	ESC ~ #	Wyse	Wyse	Wyse	Wyse	
Select TVI 925 mode	ESC ~ \$	Wyse	Wyse	Wyse	Wyse	
Select ADDS VP A2 mode	ESC ~ %	Wyse	Wyse	Wyse	Wyse	
Select HZ 1500 mode	ESC ~ &	Wyse	Wyse	Wyse	Wyse	
Select TVI 912/920 mode	ESC ~ '	Wyse	Wyse	Wyse	Wyse	
Select TVI 950 mode	ESC ~ (	Wyse	Wyse	Wyse	Wyse	
Select ADM 31 mode	ESC ~ +	Wyse	Wyse	Wyse	Wyse	
Select Native mode	ESC ~ 4	Wyse	Wyse	Wyse	Wyse	
Select PC terminal	ESC ~ 5	Wyse	Wyse	Wyse	Wyse	
Select PC graphics	ESC ~ ?	Wyse	Wyse	Wyse	Wyse	
Select VT52 mode	ESC ~ 6	Wyse	Wyse	Wyse	Wyse	
Select VT100 mode	ESC ~ ;	Wyse	Wyse	Wyse	Wyse	
Select VT220-7 bit mode	ESC ~ <	Wyse	Wyse	Wyse	Wyse	
Select VT220-8 bit mode	ESC ~ =	Wyse	Wyse	Wyse	Wyse	
Select TEK 4010/4014 mode	ESC ~ >	Wyse	Wyse	Wyse	Wyse	
<b>Communicating with the Computer</b>						
Enable transmission	CTRL Q	Same	Same	Same	Same	
Stop transmission	CTRL S	Same	Same	Same	Same	
Send ACK (if ACK mode on)	CTRL E	Wyse	Wyse	Wyse	Wyse	
ACK mode off	ESC e 6	ENH	ENH	ENH	ENH	
ACK mode on	ESC e 7	ENH	ENH	ENH	ENH	
Full-duplex mode on	ESC C ESC D F	Same	Wyse	Same	Same	
Half-duplex mode on	ESC C ESC D H	Same	Wyse	Same	Same	
Block mode on	ESC B	Same	Wyse	Same	Same	

**Table F-2** Continued

Function	Command				
	Native Mode	TeleVideo 910+	920	925	950
Half-duplex block mode on	ESC D H ESC B	Same	Same	Same	Same
Set MODEM port operating parameters [1,2,3,4]	ESC c 0 <i>baud stop parity word</i>				ESC {
Set AUX port operating parameters [1,2,3,4]	ESC c 1 <i>baud stop parity word</i>				ESC }
Enable DTR MODEM port handshaking	ESC c 4 <i>hndshk</i>	CTRL N	CTRL N	CTRL N	CTRL N
Enable X-on/X-off MODEM port handshaking	ESC c 5 <i>hndshk</i>	CTRL O	CTRL O	CTRL O	CTRL O
Send terminal ID	ESC SPACE	ESC M	ESC M	ESC M	
Load time of day [8,9]	ESC c 8 <i>hh mm</i>			ESC SPACE	ESC SPACE
<b>Controlling the Terminal and Keyboard</b>					
Local edit mode on	ESC k	Same		Same	Same
Duplex edit mode on	ESC l	Same		Same	Same
Sound bell	CTRL G	Same	Same	Same	Same
Unlock keyboard	CTRL N or ESC "	ESC "	ESC "	ESC "	ESC "
Lock keyboard	CTRL O or ESC #	ESC #	ESC #	ESC #	ESC #
Keyclick off	ESC e \$	ESC <		ESC <	ESC <
Keyclick on	ESC e %	ESC >		ESC >	ESC >
CAPS LOCK on	ESC e &	ENH		ENH	ENH
CAPS LOCK off	ESC e '	ENH		ENH	ENH
Key repeat off	ESC e ,	ENH	ENH	ENH	ENH
Key repeat on	ESC e -	ENH	ENH	ENH	ENH
<b>Redefining the Keys</b>					
Program function key definition [10,11]	ESC z <i>fkey sequence</i> DEL	ENH	ENH	ENH	ENH
Program key direction and definition [10,11,12,13]	ESC Z <i>dir key sequence</i> DEL	ESC	ESC	ESC	ESC
<b>Screen and Cursor Display</b>					
Screen display off	ESC ' 8	ESC o	ESC o	ESC o	ESC o
Screen display on	ESC ' 9	ESC n	ESC n	ESC n	ESC n
Screen saver off	ESC e P	ENH	ENH	ENH	ENH

**Table F-2 Continued**

<b>Function</b>	<b>Command</b>				
	<b>Native Mode</b>	<b>TeleVideo 910+</b>	<b>920</b>	<b>925</b>	<b>950</b>
Screen saver on	ESC e Q	ENH	ENH	ENH	ENH
Reverse screen	ESC ^ 1	ESC b	ESC b	ESC b	ESC b
Restore normal screen	ESC ^ 0	ESC d	ESC d	ESC d	ESC d
Smooth scrolling on		ESC 8 <sup>1</sup>	ESC 8 <sup>1</sup>	ESC 8 <sup>1</sup>	ESC 8
Smooth scrolling off		ESC 9 <sup>1</sup>	ESC 9 <sup>1</sup>	ESC 9 <sup>1</sup>	ESC 9
Set cursor display features [15]	ESC ' cursor	ESC .	ESC .	ESC .	ESC .
<b>Displaying the Message Fields</b>					
Program/display computer message on status line [16]	ESC F <i>message</i> CR	ENH	ENH	ENH	ENH
Program computer message on unshifted label line <sup>2</sup> [17]	ESC z ( <i>text</i> CR	ESC f <sup>1</sup>	ESC f <sup>1</sup>	ESC f <sup>1</sup>	ESC f
Turn on unshifted label line		ESC g <sup>1</sup>	ESC g <sup>1</sup>	ESC g	ESC g
Turn off unshifted label line	ESC A 11 <sup>2</sup>	ESC h <sup>1</sup>	ESC h <sup>1</sup>	ESC h	ESC h
Turn off shifted label line	ESC z DEL	ENH	ENH	ENH	ENH
Clear shifted label line	ESC z ) CR	ENH	ENH	ENH	ENH
Program/display function key label [18,19]	ESC z <i>field label</i> CR	ENH	ENH	ENH	ENH
Clear function key label [19]	ESC z <i>field</i> CR	ENH	ENH	ENH	ENH
<b>Display Memory</b>					
Display previous page	ESC w B or ESC J <sup>4</sup>	ESC J	ESC J	ESC J	ESC J
Display next page	ESC w C or ESC K <sup>4</sup>	ESC K	ESC K	ESC K	ESC K
<b>Display Attributes</b>					
Assign display attribute to a message field [21,22]	ESC A <i>n attr</i>	ESC \ <sup>3</sup>	ESC \ <sup>3</sup>	ESC \ <sup>3</sup>	ESC \ <sup>3</sup>
Assign character display attribute [22]	ESC G <i>attr</i>	Same	Same	Same	Same
Clear unprotected page to display attribute		Wyse	Wyse	Wyse	ENH
Start reverse video		ESC j			

1. With enhance mode on

2. Automatically displayed in native mode; may be hidden by assigning blank attribute (ESC A 1 1)

3. With enhance mode off

4. If screen is not split

**Table F-2 Continued**

Function	Command					
	Native Mode	TeleVideo	910+	920	925	950
End reverse video					ESC k	
Start underline					ESC l	
End underline					ESC m	
Start blink					ESC ^	
End blink					ESC q	
Start blank					ESC _	
End blank					ESC q	
<b>Protecting Data</b>						
Write-protect mode off	ESC (	Same	Same	Same	Same	
Write-protect mode on	ESC )	Same	Same	Same	Same	
Clear cursor column to write-protected spaces	ESC V	Same	Same	Same	Same	
Protect mode off	ESC '	Same	Same	Same	Same	
Protect mode on	ESC &	Wyse	Same	Same	Same	
<b>Graphics Characters</b>						
Line drawing graphics mode on	ESC H CTRL B	ESC \$ <sup>1</sup>	ESC \$ <sup>1</sup>	ESC \$ <sup>1</sup>	ESC \$ <sup>1</sup>	
Line drawing graphics mode off	ESC H CTRL C	ESC % <sup>1</sup>	ESC % <sup>1</sup>	ESC % <sup>1</sup>	ESC % <sup>1</sup>	
<b>Controlling the Cursor</b>						
Cursor left (backspace)	CTRL H	Same	Same	Same	Same	
Cursor right	CTRL L	Same	Same	Same	Same	
Cursor up; no scroll	CTRL K	Same	Same	Same	Same	
Cursor up; scroll (reverse linefeed)	ESC j	Wyse		Same	Same	
Cursor down; no scroll		CTRL V	CTRL V	CTRL V	CTRL V	
Cursor down; scroll (linefeed)	CTRL J	Same	Same	Same	Same	
Cursor to start of line	CTRL M	Same	Same	Same	Same	
Cursor to start of next line	CTRL _	Same	Same	Same	Same	
Home cursor	ESC { or CTRL ^	Wyse Same	Wyse Same	Wyse Same	Wyse Same	
Cursor to specific column		ESC ]				
Cursor to specific line		ESC [				
End-of-line wrap off	ESC d .					

**Table F-2 Continued**

<b>Function</b>	<b>Command</b>				
	<b>Native Mode</b>	<b>TeleVideo 910+</b>	<b>920</b>	<b>925</b>	<b>950</b>
End-of-line wrap on	ESC d /				
Received CR mode off	ESC e 4	ENH	ENH	ENH	ENH
Received CR mode on	ESC e 5	ENH	ENH	ENH	ENH
Autopage mode off	ESC d *	ESC w	ESC w	ESC w	ESC w
Autopage mode on	ESC d +	ESC v	ESC v	ESC v	ESC v
Line lock mode on	ESC ' H				ESC ! 1
Line lock mode off	ESC ' I				ESC ! 2
Address cursor in 80-column current page [20]	ESC = <i>line col</i>	Same	Same	Same	Same
Address cursor in specific 80-column page [26,20]	ESC w @ <i>page line col</i>	ESC - <sup>3</sup>	ESC - <sup>3</sup>	ESC - <sup>3</sup>	ESC - <sup>3</sup>
Read cursor address in 80-column current page	ESC ?	Same	Same	Same	
Read 80-column window/page number and cursor address	ESC /	ENH	ENH	Same	Same
<b>Editing</b>					
Clear all tab stops	ESC 0	ESC 3	ESC 3	ESC 3	ESC 3
Set tab stop	ESC 1	Same	Same	Same	Same
Clear tab stop	ESC 2	Same	Same	Same	Same
Tabulate cursor	ESC i or CTRL I	CTRL I	CTRL I	CTRL I	CTRL I
Backtab	ESC I	Same	Same	Same	Same
Field tab		ESC i	ESC i	ESC i	ESC i
Insert mode on, replace mode off	ESC q	ENH		ENH	Same
Insert mode off, replace mode on	ESC r	ENH		ENH	Same
Page edit mode off	ESC e "				ESC O
Page edit mode on	ESC e #				ESC N
Insert space character	ESC Q	Same	Same	Same	Same
Insert line of spaces	ESC E	Same	Same	Same	Same
Delete cursor character	ESC W	Same	Same	Same	Same
Delete cursor line	ESC R	Same	Same	Same	Same

Table F-2 Continued

Function	Command				
	Native Mode	TeleVideo 910+	920	925	950
<b>Clearing Data</b>					
Clear page to nulls	ESC *	Same	Same	Same	Same
Clear unprotected page to spaces	ESC; or CTRL Z	ESC ; or ESC +	ESC ; or ESC +	ESC ; or ESC +	ESC ; or ESC +
Clear unprotected page to protected spaces		ESC,		ESC ,	ESC ,
Clear unprotected page to nulls	ESC :	Same	Same	Same	Same
Clear unprotected page to display attribute [22]		ESC !	ESC !	ESC !	ESC !
Clear unprotected page to spaces from cursor	ESC Y	Same	Same	Same	Same
Clear unprotected page to nulls from cursor	ESC y	Same	Same	Same	Same
Clear unprotected line to spaces from cursor	ESC T	Same	Same	Same	Same
Clear unprotected line to nulls from cursor	ESC t	Same	Same	Same	Same
<b>Sending Data</b>					
Send entire cursor line	ESC 6	Same	Same	Same	Same
Send unprotected line	ESC 4	Same	Same	Same	Same
Send entire page	ESC 7	Same	Same	Same	Same
Send unprotected page	ESC 5	Same	Same	Same	Same
Send entire block	ESC s	Same	Same	Same	Same
Send unprotected characters in block	ESC S	Same	Same	Same	Same
<b>Print Functions</b>					
Set print terminator		ESC p	ESC p	ESC p	ESC p
Define delimiters		ESC x	ESC x <sup>1</sup>	ESC x	ESC x <sup>1</sup>
Print formatted page	ESC P	Wyse	Same	Same	Same
Print unformatted page	ESC p	ESC L	ESC L		ESC L
Print page with time				ESC L	
Auxiliary print mode off	CTRL T	ESC A	ESC A	ESC A	ESC A
Auxiliary print mode on	CTRL R	ESC @	ESC @	ESC @	ESC @
Transparent print mode off	CTRL T	ESC a	ESC a	ESC a	ESC a
Transparent print mode on	ESC d #	ESC '	ESC '	ESC '	ESC '
Bidirectional mode off	ESC d \$	CTRL T	CTRL T	CTRL T	CTRL T
Bidirectional mode on	ESC d %	CTRL R	CTRL R	CTRL R	CTRL R

**Table F-3 PC Terminal Mode Commands**

Function	Command
<b>Monitor Mode</b>	
Monitor mode on	ESC U
Monitor mode off	ESC u or ESC X
<b>Selecting Other Personalities</b>	
Enhance mode off	ESC v SPACE
Enhance mode on	ESC v !
Select WY-50+ mode	ESC v "
Select TVI 910+ mode	ESC v #
Select TVI 925 mode	ESC v \$
Select ADDS VP A2 mode	ESC v %
Select HZ 1500 mode	ESC v &
Select TVI 920 mode	ESC v '
Select TVI 950 mode	ESC v (
Select ADM 31 mode	ESC v +
Select Native mode	ESC v 4
Select PC Terminal	ESC v 5
Select PC Graphics	ESC v ?
Select VT52 mode	ESC v 6
Select VT100 mode	ESC v ;
Select VT220-7 bit mode	ESC v <
Select VT220-8 bit mode	ESC v =
Select TEK 4010/4014 mode	ESC v >
<b>Communicating with the Computer</b>	
Enable transmission	CTRL Q
Stop transmission	CTRL S
Send ACK (if ACK mode on)	CTRL E
Full-duplex mode on	ESC }
Half-duplex mode on	ESC {
Block mode on	ESC B
Block mode off (conversation)	ESC C
Enable DTR MODEM port handshaking	CTRL N
Enable X-on/X-off MODEM port handshaking	CTRL O
Program answerback message [7]	ESC ] <i>answer</i> CR
Load time of day [8,9]	ESC SPACE <i>hh mm</i>
<b>Controlling the Terminal and Keyboard</b>	
Local edit mode on	ESC k
Duplex edit mode on	ESC l
Sound bell	CTRL G

Table F-3 Continued

Function	Command
Unlock keyboard	ESC "
Lock keyboard	ESC #
Keyclick off	ESC <
Keyclick on	ESC >
Margin bell off	ESC n
Turn margin bell on and set position	ESC o
Read status	ESC [
Default unit	ESC m
<b>Redefining the Keys</b>	
Program function key definition [10,11]	ESC z <i>fkey sequence</i> DEL
Program key direction & definition [10,11,12,13]	ESC
<b>Screen and Cursor Display</b>	
Screen display off	ESC O
Screen display on	ESC N
Set cursor display features [15]	ESC .
User line display off	ESC e
Display 25 data lines	ESC ^
<b>Displaying the Message Fields</b>	
Program computer message on unshifted label line <sup>1</sup> [17]	ESC f
<b>Display Attributes</b>	
Assign character display attribute [22]	ESC G <i>attr</i>
<b>Protecting Data</b>	
Write-protect mode off	ESC (
Write-protect mode on	ESC )
Protect mode off	ESC '
Protect mode on	ESC &
<b>Graphics Characters</b>	
Line drawing graphics mode on	ESC \$
Line drawing graphics mode off	ESC %
<b>Controlling the Cursor</b>	
Cursor left (backspace)	CTRL H
Cursor right	CTRL L
1. With enhance mode off	

Table F-3 Continued

Function	Command
Cursor up; no scroll	CTRL K
Cursor up; scroll (reverse linefeed)	ESC j
Cursor down; no scroll	CTRL V
Cursor down; scroll (linefeed)	CTRL J
Cursor to start of line	CTRL M
Cursor to start of next line	CTRL _
Home cursor	CTRL ^
End-of-line wrap off	ESC 0
End-of-line wrap on	ESC ~
Received CR mode off	ESC 9
Received CR mode on	ESC 8
Address cursor in 80-column current page [22]	ESC = <i>line col</i>
Address cursor in specific 80-column window/page <sup>2</sup> [26,20]	ESC - <i>wnd/ page line col</i>
Read cursor address in 80-column current page	ESC ?
Read 80-column window/page number and cursor address	ESC /
<hr/>	
<b>Editing</b>	
Clear all tab stops	ESC 3
Set tab stop	ESC 1
Clear tab stop	ESC 2
Tabulate cursor	CTRL I
Backtab	ESC I
Field tab	ESC i
Insert mode on, replace mode off	ESC Z
Insert mode off, replace mode on	ESC r
Insert space character	ESC Q
Insert line of spaces	ESC E
Delete cursor character	ESC W
Delete cursor line	ESC R
<hr/>	
<b>Clearing Data</b>	
Clear page to nulls	ESC *
Clear page to write-protected spaces	ESC ,
Clear unprotected page to spaces	ESC ; or CTRL Z or ESC +
Clear unprotected page to nulls	ESC :
<hr/>	
2. If screen is not split	

Table F-3 Continued

Function	Command
Clear unprotected page to spaces from cursor	ESC Y
Clear unprotected page to nulls from cursor	ESC y
Clear unprotected line to spaces from cursor	ESC T
Clear unprotected line to nulls from cursor	ESC t
Fill page with H's	ESC F
<b>Sending Data</b>	
Send entire cursor line	ESC 6
Send unprotected line	ESC 4
Send entire page	ESC 7
Send unprotected page	ESC 5
Send entire block	ESC s
Send unprotected characters in block	ESC S
Report terminal status	ESC [
Report attribute under cursor	ESC D
<b>Print Functions</b>	
Set print terminator	ESC p
Define delimiters	ESC x
Print formatted page	ESC P
Print all unprotected	ESC L
Auxiliary print mode off	ESC A
Auxiliary print mode on	ESC @
Transparent print mode off	ESC a
Transparent print mode on	ESC '
Bidirectional mode off	CTRL T
Bidirectional mode on	CTRL R

**Variable Values for Table F-1, F-2, and F-3 Commands**

[1]	baud	MODEM Port	AUX Port	baud	MODEM Port	AUX Port
0	38400	19200		9	300	600
1	19200	9600		:		300
2	9600	7200		;	134.5	
3	4800	4800		<	110	134.5
4	2400			=		110
5		2400		>	50	50
7	1200			?	200	200
8	600	1200		@	7200	38400

[2]	stop	Stop Bits	[3]	parity	Parity Bit
	0	1		0	None
	1	2		1	Odd
				2	Mark
[4]	word	Data Word		3	Even
	0	7 bits		4	Space
	1	8 bits			
[ 5 ]	<i>hndshk</i>	Handshaking Protocol	[6]	<i>max</i>	Maximum Speed
	Receive	Transmit		1	60 characters per second
0	None	None		2	None
1	X-on/X-off	X-on/X-off		3	150 characters per second
2	DTR	DSR			
3	Both	Both			
[7]	<i>answer</i> = Up to 20 characters to define answerback message				
[8]	<i>hh</i> = Hour (two-digit decimal number between 00 and 23)				
[9]	<i>mm</i> = Minutes (two-digit decimal number between 00 and 59)				
[10]	<i>sequence</i> = Up to 255 bytes to be loaded in function key				
[11]	Function Key Values				
Function	<i>fkey</i>		Function	<i>fkey</i>	
Key	Unshifted	Shifted	Key	Unshifted	Shifted
F1	@	'	F9	H	h
F2	A	a	F10	I	i
F3	B	b	F11	J	j
F4	C	c	F12	K	k
F5	D	d	F13	L	l
F6	E	e	F14	M	m
F7	F	f	F15	N	n
F8	G	g	F16	O	o
[12]	<i>dir</i>	Direction			
	0	Normal			
	1	Remote			
	2	Local			

## [13] Editing Key Values

## Keyboard Style

WY-99GT

ASCII

VT220

ESC

SHIFT ESC

TAB

TAB

SHIFT TAB

SHIFT TAB

BACKSPACE

☒

SHIFT BACKSPACE

SHIFT ☒

DEL

REMOVE

SHIFT DEL

SHIFT REMOVE

RETURN

RETURN

SHIFT RETURN

SHIFT RETURN

HOME

SHIFT HOME

▲

SHIFT ▲

SHIFT ▲

▼

SHIFT ▼

SHIFT ▼

◀

SHIFT ▲

SHIFT ▲

▶

SHIFT ▶

SHIFT ▶

ENTER

ENTER

SHIFT ENTER

SHIFT ENTER

REPL

PF4

INS

SHIFT PF4

NEXT PAGE

NEXT SCRN

PREV PAGE

SHIFT NEXT SCRN

SEND

PRINT

CLR LINE

PF3

CLR SCRN

SHIFT PF3

DEL CHAR

PF2

DEL LINE

SHIFT PF2

INS CHAR

INS LINE

Enhanced PC

key  
Value

ESC

SPACE

SHIFT ESC

%

TAB→

!

SHIFT TAB→

&amp;

←BACKSPACE

"

SHIFT ←BACKSPACE

,

REMOVE

#

SHIFT REMOVE

(

RETURN

\$

SHIFT RETURN

)

HOME

\*

SHIFT HOME

/

↑

+

SHIFT ↑

0

↓

,

SHIFT ↓

1

←

-

SHIFT ←

2

→

.

SHIFT →

3

ENTER<sup>kpd</sup>

s

SHIFT ENTER<sup>kpd</sup>

4

INSERT

q

SHIFT INSERT

p

PAGE DOWN

r

SHIFT PAGE DOWN

w

u

v

t

x

}

z

DELETE

5

SHIFT DELETE

6

7

8

Q

## [13] Continued

## Keyboard Style

WY-99GT

ASCII

	VT220	Enhanced PC	key Value
	SHIFT F17	PRINT SCREEN	R
		SHIFT PRINT SCREEN	X
	F18		S
	SHIFT F18		Y
	F19		T
	SHIFT F19		Z
	F20		P
	SHIFT F20		V
		END	\
		SHIFT END	]
		PAGE UP	:
		SHIFT PAGE UP	;

[14]	scroll	Scrolling Type	Speed (Ips)	[15]	cursor	Cursor Display
	@	Jump scroll		0		Cursor display off
	<	Smooth scroll	1	1		Cursor display on
	=	Smooth scroll	2	2		Steady block cursor
	>	Smooth scroll	4	3		Blinking line cursor
	?	Smooth scroll	8	4		Steady line cursor
				5		Blinking block cursor

[16]	Character String	80-Column Screen	132-Column Screen
	message	46 characters	98 characters
[17]	text	78 characters	130 characters
[18]	label	9 characters	7 characters

[19]	field		Key	field	
Key	Unshifted	Shifted	Key	Unshifted	Shifted
F1	0	P	F9	8	X
F2	1	Q	F10	9	Y
F3	2	R	F11	:	Z
F4	3	S	F12	:	[
F5	4	T	F13	<	\
F6	5	U	F14	=	]
F7	6	V	F15	>	^
F8	7	W	F16	?	SPACE

[20] ASCII Line and Column Codes (Native Mode <sup>1</sup> )							
Line/ Column	line/ col	Line/ Column	line/ col	Line/ Column	line/ col	Line/ Column	line/ col
1	space	25	8	49	P	73	h
2	!	26	9	50	Q	74	i
3	"	27	:	51	R	75	j
4	#	28	;	52	S	76	k
5	\$	29	<	53	T	77	l
6	%	20	=	54	U	78	m
7	&	31	>	55	V	79	n
8	,	32	?	56	W	80	o
9	(	33	@	57	X	81	p
10	)	34	A	58	Y	82	q
11	*	35	B	59	Z	83	r
12	+	36	C	60	[	84	s
13	,	37	D	61	\	85	t
14	-	38	E	62	]	86	u
15	.	39	F	63	^	87	v
16	/	40	G	64	-	88	w
17	0	41	H	65	'	89	x
18	1	42	I	66	a	90	y
19	2	43	J	67	b	91	z
20	3	44	K	68	c	92	{
21	4	45	L	69	d	93	
22	5	46	M	70	e	94	}
23	6	47	N	71	f	95	-
24	7	48	O	72	g	96	DEL/RUB

1. Native codes also recognized in WY-50+, ADM 31, TeleVideo 910+/920/925/950, VT52, PC Terminal and Graphics modes, and in ADDS VP A2 mode absolute cursor addressing

### ASCII Line Codes (ADDS VP A2, HZ 1500)

ADDS VP A2							
Line	HZ 1500						
1	CTRL @	7	CTRL F	13	CTRL L	19	CTRL R
2	CTRL A	8	CTRL G	14	CTRL M	20	CTRL S
3	CTRL B	9	CTRL H	15	CTRL N	21	CTRL T
4	CTRL C	10	CTRL I	16	CTRL O	22	CTRL U
5	CTRL D	11	CTRL J	17	CTRL P	23	CTRL V
6	CTRL E	12	CTRL K	18	CTRL Q	24	CTRL W

## ASCII Column Codes (ADDS VP A2, HZ 1500)

Column	ADDS VP A2	HZ 1500	Column	ADDS VP A2	HZ 1500	Column	ADDS VP A2	HZ 1500
1	CTRL @	CTRL @	28	,	!	55	T	<
2	CTRL A	CTRL A	29	(	"	56	U	=
3	CTRL B	CTRL B	30	)	#	57	V	>
4	CTRL C	CTRL C	31	0	\$	58	W	?
5	CTRL D	CTRL D	32	1	%	59	X	@
6	CTRL E	CTRL E	33	2	&	60	Y	A
7	CTRL F	CTRL F	34	3	,	61	/	B
8	CTRL G	CTRL G	35	4	(	62	a	C
9	CTRL H	CTRL H	36	5	)	63	b	D
10	CTRL I	CTRL I	37	6	*	64	c	E
11	CTRL P	CTRL J	38	7	+	65	d	F
12	CTRL Q	CTRL K	39	8	,	66	e	G
13	CTRL R	CTRL L	40	9	-	67	f	H
14	CTRL S	CTRL M	41	@	.	68	g	I
15	CTRL T	CTRL N	42	A	/	69	h	J
16	CTRL U	CTRL O	43	B	0	70	i	K
17	CTRL V	CTRL P	44	C	1	71	p	L
18	CTRL W	CTRL Q	45	D	2	72	q	M
19	CTRL X	CTRL R	46	E	3	73	r	N
20	CTRL Y	CTRL S	47	F	4	74	s	O
21	SPACE	CTRL T	48	G	5	75	t	P
22	!	CTRL U	49	H	6	76	u	Q
23	"	CTRL V	50	I	7	77	v	R
24	#	CTRL W	51	P	8	78	w	S
25	\$	CTRL X	52	Q	9	79	x	T
26	%	CTRL Y	53	R	:	80	y	U
27	&	SPACE	54	S	;			

[21] *n*      Screen Area

- 0      Data area\*
- 1      Function key label line
- 2      Terminal message field
- 3      Computer message field

\* In native mode, only the reverse attribute can be assigned to the data area

**[22] Display Attribute Codes**

<i>attr</i>	<b>Display Attributes</b>
SPACE	Space character
0	Normal
1	Invisible
2	Blink
3	Invisible
4	Reverse
5	Reverse and invisible
6	Reverse and blink
7	Reverse, blink, invisible
8	Underline
9	Underline and invisible
:	Underline and blink
;	Underline, blink, invisible
<	Underline and reverse
=	Underline, reverse, invisible
>	Underline, reverse, blink
?	Underline, reverse, blink, invisible

<i>attr</i>	<b>Display Attributes</b>
p	Dim
q	Dim and invisible
r	Dim and blink
s	Dim, blink, invisible
t	Dim and reverse
u	Dim, reverse, invisible
v	Dim, reverse, blink
w	Dim, reverse, blink, invisible
x	Dim and underline
y	Dim, underline, invisible
z	Dim, underline, blink
{	Dim, underline, blink, invisible
	Dim, underline, reverse
}	Dim, underline, reverse, invisible
"	Dim, underline, reverse, blink,
DEL	Dim, underline, reverse, blink, invisible

**[23] Write-Protected**

<i>wpca</i>	<b>Display Attribute</b>
6	Reverse*
7	Dim*
A	Normal*
B	Blink on
C	Invisible on
E	Underline on
F	Reverse on
G	Dim on

\* Clears other write-protected attributes

**[24] *lattr***

<b>Line Attribute</b>
@ Single-high, single-wide characters
A Single-high, double-wide characters
B Top half of double-high, single-wide characters
C Bottom half of double-high, single-wide characters
D Top half of double-high, double-wide characters
E Bottom half of double-high, double-wide characters
G Normal background
H Bold background
I Invisible background
J Dim background

**[25] Graphics Character Codes**

Graphics Character	<i>key</i>						
T	0	+	4	+	8	=	<
L	1	-	5	-	9	+	=
F	2		6	-	:		>
7	3	█	7	█	;	█	?

- [26] *wnd/page*      **Window or Page**  
0                      Page 0 or upper window  
1                      Page 1 or lower window
- [27] *///* = One- to three-decimal value of line relative to home
- [28] *ccc* = One- to three-decimal value of column relative to home
- [29] *char* = Character that replaces unprotected characters
- [30] *width* = Column code from [20] for column number representing absolute number of columns to right of cursor
- [31] *height* = Line code from [20] for line number representing absolute number of lines below cursor
- [32] *bank*      **Font Bank\***  
0                      Font bank 0  
1                      Font bank 1  
2                      Font bank 2  
3                      Font bank 3
- 
- \* Holds predefined character set
- [33] *set*      **Predefined Character Set**  
@                      Native/WY-50+  
A                      PC Multinational  
B                      Standard ASCII  
C                      Not used  
D                      PC standard  
E                      Not used  
F                      Not used  
G,H                   US ANSI  
I                      ANSI Multinational  
J                      ANSI Alternate Characters
- [34] *pp* = 2-byte hex value of character position\*
- [35] *bb...bb* = 32-byte character string defining bit pattern of character

## Appendix



# VT52 Command Guide

Table G-1 VT52 Mode Escape Sequences

Command	Sequence
Move cursor up one line	ESC A
Move cursor down one line	ESC B
Move cursor right one column	ESC C
Move cursor left one column	ESC D
Move cursor to home position	ESC H
Move cursor up one line with scroll	ESC I
Move cursor to line <i>line</i> , column <i>col</i>	ESC Y <i>line col</i>
Select graphics character set	ESC F
Select U.S. ASCII character set	ESC G
Erase from cursor to end of display	ESC J
Erase from cursor to end of line	ESC K
Print cursor line	ESC V
Print display	ESC ]
Transparent print mode on	ESC W
Transparent print mode off	ESC X
Copy print mode on	ESC ^
Copy print mode off	ESC _
Keypad application mode on	ESC =
Keypad application mode off	ESC >
Enter VT100 mode	ESC <
Identify terminal	ESC Z

## Appendix

# H ANSI Command Guide

Appendix H contains a complete list of ANSI commands. Note that mnemonics beginning with WY are Wyse proprietary, and mnemonics beginning with DEC are Digital Equipment Corporation proprietary. All others are ANSI standard.

**Table H-1 Supported ANSI Commands**

Command	Sequence	Mnemonic
<b>Controlling Functional Modes<sup>1</sup></b>		
Lock keyboard	CSI 2 h	KAM
Unlock keyboard	CSI 2 l	KAM
Monitor mode on <sup>2</sup>	CSI 3 h	CRM
Monitor mode off	CSI 3 l	CRM
Insert mode on	CSI 4 h	IRM
Insert mode off	CSI 4 l	IRM
Local echo off	CSI 12 h	SRM
Local echo on	CSI 12 l	SRM
Control execution off <sup>2</sup>	CSI 13 h	FEAM
Control execution on <sup>2</sup>	CSI 13 l	FEAM
Transmit through cursor position	CSI 16 h	TTM
Transmit to end of line or end of display	CSI 16 l	TTM
New line mode on	CSI 20 h	LNM
New line mode off	CSI 20 l	LNM
Cursor keys send application-dependent codes	CSI ?1 h	DECCKM
Cursor keys send cursor movement codes	CSI ?1 l	DECCKM
VT52 mode on	CSI ?2 l	DECANM
132-column display	CSI ?3 h	DECCOLM
80-column display	CSI ?3 l	DECCOLM

1. More than one mode, but less than 17, may be set with one sequence. Enter multiple numeric parameters separated by semicolons (;). However, you cannot combine sequences containing "?" with those that don't contain "?", nor can you combine sequences ending with "h" with those ending with "l".
2. To toggle monitor mode and control execution off from the keyboard, press CTRL SHIFT 1 (use the 1 on the numeric keypad).

Table H-1 Continued

Sequence	Mnemonic
Smooth scrolling on	CSI ?4 h
Jump scrolling on	CSI ?4 1
Reverse screen video on	CSI ?5 h
Normal screen video on	CSI ?5 1
Line 1 is top of scrolling region	CSI ?6 h
Line 1 is top of display area	CSI ?6 1
Autowrap on	CSI ?7 h
Autowrap off	CSI ?7 1
Autorepeat on	CSI ?8 h
Autorepeat off	CSI ?8 1
Block mode on	CSI ?10 h
Block mode off	CSI ?10 1
Unshifted function keys operate locally	CSI ?16 h
Unshifted function keys operate remotely	CSI ?16 1
Send form feed after print screen operation	CSI ?18 h
No form feed sent after print screen operation	CSI ?18 1
Print full screen	CSI ?19 h
Print scrolling region	CSI ?19 1
Display cursor	CSI ?25 h
Cursor off	CSI ?25 1
Blank screen	CSI 30 h
Display screen	CSI 30 1
Display status line	CSI 31 h
Blank status line	CSI 31 1
Screen saver	CSI 32 h
Screen saver off	CSI 32 1
Cursor steady (nonblinking)	CSI 33 h
Cursor blinking	CSI 33 1
Underline cursor on	CSI 34 h
Block cursor on	CSI 34 1
Don't clear screen after width change	CSI 35 h
Clear screen after width change	CSI 35 1
☒ set to BS/DEL	CSI 36 h
☒ set to DEL/CAN	CSI 36 1
Send erasable and nonerasable characters	CSI 37 h
Send only erasable characters	CSI 37 1

Table H-1 Continued

Command	Sequence	Mnemonic
Send full screen	CSI 38 h	WYTEXM
Send scrolling region	CSI 38 l	WYTEXM
10 x 10 character cell	CSI 39 h	WYCELL
10 x 13 character cell	CSI 39 l	WYCELL
Turn 25th line on	CSI 40 h	WYEXTDM
Turn 25th line off	CSI 40 l	WYEXTDM
<b>Controlling Terminal Compatibility Modes</b>		
VT200 8-bit mode on	CSI 62;2 "p	DECSDL
VT200 7-bit mode on	CSI 62;1 "p	DECSDL
VT100 mode on	CSI 61 "p	DECSDL
VT52 mode on	CSI ?2 l	DECANM
8-bit transmission mode on (VT200)	ESC SPACE G	S8C1T
7-bit transmission mode on (VT200)	ESC SPACE F	S7C1T
<b>Controlling Character Sets</b>		
Load soft character font	DCS <i>f;n;e;ms;</i> { <i>abc uc/mc/lc;</i> ...ST	DECSDL
<i>DCS</i>	8-bit C1 control character (ESC P for 7-bit formats)	
<i>f</i>	Soft font	
<i>0</i>	Soft font selected	
<i>2</i>	Soft graphics font selected	
<i>n</i>	Initial character position; ASCII character positions are numbered consecutively, beginning with 1 (e.g., to redefine "\$" use "4")	
<i>e</i>	Erase control specified	
0 or 2	Erase all characters in set	
1	Erase only redefined characters	
<i>ms</i>	Matrix size	
0	7x10	
1	4x10	
2	5x10	
3	6x10	
4	7x10	
5	8x10	
{	A separator	
<i>abc</i>	Font code (fcode)	
<i>a</i>	U.S. ASCII character from SPACE to / (optional)	
<i>b</i>	U.S. ASCII character from SPACE to / (optional)	
<i>c</i>	U.S. ASCII character from 0 (zero) to ~ (required)	

Table H-1 Continued

Command	Sequence	Mnemonic
<i>uc/mc/lc</i>	Character code	
<i>uc</i>	U.S. ASCII characters for upper code of character	
/	Required separator	
<i>mc</i>	U.S. ASCII characters for middle code of character	
<i>lc</i>	U.S. ASCII characters for lower code of character	
ST	8-bit C1 control code (ESC \ in 7-bit format)	
Label character set	ESC <i>x fcode</i>	SCS
<i>x</i>	Label assigned	
(	G0	
)	G1	
*	G2	
+	G3	
<i>fcode</i>	Font code	
0	Special graphics	
1	Alternate character	
A	U.K. ASCII	
B	U.S. ASCII	
<	Multinational supplement	
other	Defined with load soft character font sequence (must match <i>abc</i> field in soft font load to enable soft font)	
Load G0 character set into GL	CTRL O	SO or LS1
Load G1 character set into GL	CTRL N	SI or LS0
Load G1 character set into GR	ESC ~	LS1R
Load G2 character set into GL	ESC n	LS2
Load G2 character set into GR	ESC }	LS2R
Load G3 character set into GL	ESC o	LS3
Load G3 character set into GR	ESC	LS3R
Shift G2 character set into GL for one character only	ESC N	SS2
Shift G3 character set into GL for one character only	ESC O	SS3

**Controlling Character, Field, and Line Attributes**

Define character attributes <sup>3</sup>		CSI <i>attr m</i>	SGR
<i>attr</i>	Character attribute	<i>attr</i>	Character attribute
0	Normal	8	Concealed
1	Bold	22	Normal intensity
2	Dim	24	Underscore off
4	Underscored	25	Steady (blinking off)
5	Blink	27	Positive image (reverse off)
7	Reverse video		

3. Attributes may be combined by separating character attribute parameters with semicolons ( ; ).

Table H-1 Continued

Command	Sequence	Mnemonic
Define erasable character	CSI 0 "q or CSI 2 "q	DECSCA
Define nonerasable character	CSI 1 "q	DECSCA
Define top half of double-high, double-wide line	ESC # 3	DECDDHL
Define bottom half of double-high, double-wide line	ESC # 4	DECDDHL
Define single-high, single-wide line	ESC # 5	DECSWL
Define single-high, double-wide line	ESC # 6	DECDDWL
Define top half of double-high, single-wide line	ESC # :	WYDHL
Define bottom half of double-high, single-wide line	ESC # ;	WYDHL
<b>Controlling the Cursor</b>		
Display cursor	CSI ?25 h	DECTCEM
Cursor off	CSI ?25 l	DECTCEM
Cursor steady (nonblinking)	CSI 33 h	WYSTCURM
Cursor blinking	CSI 33 l	WYSTCURM
Underline cursor on	CSI 34 h	WYULCURM
Block cursor on	CSI 34 l	WYULCURM
Cursor keys send application-dependent codes	CSI ?1 h	DECCKM
Cursor keys send cursor movement codes	CSI ?1 l	DECCKM
Move cursor to <i>n</i> column	CSI <i>n</i> G or CSI <i>n</i> '	CHA HPA
Move cursor up <i>n</i> lines	CSI <i>n</i> A	CUU
Move cursor down <i>n</i> lines	CSI <i>n</i> B or CSI <i>n</i> e	CUD VPR
Move cursor right <i>n</i> columns	CSI <i>n</i> C or CSI <i>n</i> a	CUF HPR
Move cursor left <i>n</i> columns	CSI <i>n</i> D	CUB
Move cursor down <i>n</i> lines to column 1	CSI <i>n</i> E	CNL
Move cursor up <i>n</i> lines to column 1	CSI <i>n</i> F	CPL
Move cursor to line <i>n</i>	CSI <i>n</i> d	VPA
Move cursor to line <i>n1</i> , column <i>n2</i>	CSI <i>n1</i> ; <i>n2</i> H or CSI <i>n1</i> ; <i>n2</i> f	CUP HVP
Move cursor down one line in current column, scroll up if at bottom line	IND or ESC D	IND IND
Move cursor down one line in current column; execute CR if linefeed mode is on	CTRL J or CTRL K or CTRL L	LF VT FF

Table H-1 Continued

Command	Sequence	Mnemonic
Move cursor up one line in current column, scroll down if at top line	RI or ESC M	RI RI
Move cursor down one line to column 1	NEL or ESC E	NEL NEL
Save display attributes, cursor position, character sets, wrap flag, and origin mode status	ESC 7	DECSC WYSC
Restore last saved display attributes, cursor position, character set, wrap flag, and origin mode status	ESC 8 or CSI u	DECRC WYRC
Backspace cursor	CTRL H	BS
Move cursor to next tab stop	CTRL I	HT
Move cursor to column 1 of current line	CTRL M	CR
<b>Editing Functions</b>		
Erase from cursor to end of display	CSI 0 J	ED
Erase from start of display to cursor	CSI 1 J	ED
Erase entire display	CSI 2 J	ED
Erase from cursor to end of line	CSI 0 K	EL
Erase from start of line to cursor	CSI 1 K	EL
Erase entire line	CSI 2 K	EL
Erase erasable characters from cursor to end of display	CSI ?0 J	DECSED
Erase erasable characters from start of display to cursor	CSI ?1 J	DECSED
Erase erasable characters in entire display	CSI ?2 J	DECSED
Erase erasable characters from cursor to end of line	CSI ?0 K	DECSEL
Erase erasable characters from start of line to cursor	CSI ?1 K	DECSEL
Erase erasable characters from entire line	CSI ?2 K	DECSEL
Erase <i>n</i> characters beginning at cursor	CSI <i>n</i> X	ECH
Insert <i>n</i> blank characters beginning at cursor	CSI <i>n</i> @	ICH
Insert <i>n</i> blank lines beginning at cursor line	CSI <i>n</i> L	IL
Delete <i>n</i> lines beginning at cursor line	CSI <i>n</i> M	DL
Delete <i>n</i> characters beginning at cursor	CSI <i>n</i> P	DCH

Table H-1 Continued

Command	Sequence	Mnemonic
<b>Controlling Margins</b>		
Set top/bottom margins	CSI <i>t</i> ; <i>b</i> r	DECSTBM
<i>t</i>	Top line number	
<i>b</i>	Bottom line number (optional; if omitted, treated as bottom screen line)	
<b>Controlling Tabs</b>		
Clear tab stop at cursor	CSI 0 g or CSI 2 W	TBC CTC
Clear all tab stops	CSI 3 g or CSI 5 W	TBC CTC
Set tab stop at cursor	CSI 0 W or ESC H	CTC HTS
Set tab stop every 8th column	CSI ?5 W	CTC
Move forward <i>n</i> tab stops	CSI <i>n</i> I	CHT
Move backward <i>n</i> tab stops	CSI <i>n</i> Z	CBT
Move cursor to next tab stop	CTRL I	HT
<b>Controlling Scrolling</b>		
Smooth scrolling on	CSI ?4 h	DECSCLM
Jump scrolling on	CSI ?4 1	DECSCLM
Set 4 lps smooth scrolling speed	CSI 0 z	WYSCRATE
Set 1 lps smooth scrolling speed	CSI 1 z	WYSCRATE
Set 2 lps smooth scrolling speed	CSI 2 z	WYSCRATE
Set 4 lps smooth scrolling speed	CSI 3 z	WYSCRATE
Set 8 lps smooth scrolling speed	CSI 4 z	WYSCRATE
<b>Controlling Function Keys</b>		
Unshifted function keys operate locally	CSI ?16 h	DECEKEM
Unshifted function keys operate remotely	CSI ?16 1	DECEKEM
Program function keys <sup>4</sup>	DCS <i>c</i> ; <i>kl</i>   <i>kc</i> / <i>hc</i> ST	DECUKD
<i>c</i>	Clear	
0	Clear all key definitions	
1	Clear keys only as they are redefined	
<i>kl</i>	Key lock	
0	Lock key definitions	
1	Don't lock key definitions	

4. Multiple function key definitions can be programmed by entering the <kc>/<hc> parameters for each, separated by semicolons (;).

Table H-1 Continued

Command	Sequence	Mnemonic
<i>kc</i> Shifted function key	<i>kc</i>	Unshifted function key
17 F6	37	F6
18 F7	38	F7
19 F8	39	F8
20 F9	40	F9
21 F10	41	F10
23 F11	43	F11
24 F12	44	F12
25 F13	45	F13
26 F14	46	F14
28 HELP (F15)	48	HELP (F15)
29 DO (F16)	49	DO (F16)
31 F17	51	F17
32 F18	52	F18
33 F19	53	F19
34 F20	54	F20
<i>hc</i> Hexadecimal representation of character string assigned to the function key.		
Report function key redefinition string	CSI < <i>n</i>	WYFKE <sub>X</sub>
<i>n</i> Shifted function key	<i>n</i>	Unshifted function key
a F6	A	F6
b F7	B	F7
c F8	C	F8
d F9	D	F9
e F10	E	F10
f F11	F	F11
g F12	G	F12
h F13	H	F13
i F14	I	F14
j HELP (F15)	J	HELP (F15)
k DO (F16)	K	DO (F16)
l F17	L	F17
m F18	M	F18
n F19	N	F19
o F20	O	F20
<b>Auxiliary Keypad Modes</b>		
Auxiliary keypad numeric mode on	ESC >	DECKPNM
Auxiliary keypad application mode on	ESC =	DECKPAM
<b>Transmission/Printer Control</b>		
Transmit through cursor position	CSI 16 h	TTM
Transmit to end of line or end of display	CSI 16 l	TTM
Send form feed after print screen operation	CSI ?18 h	DECCPFF
No form feed sent after print screen operation	CSI ?18 l	DECCPFF

Table H-1 Continued

Command	Sequence	Mnemonic
Print full screen	CSI ?19 h	DECPEX
Print scrolling region	CSI ?19 l	DECPEX
Send erasable and nonerasable characters	CSI 37 h	WYGATM
Send only erasable characters	CSI 37 l	WYGATM
Send full screen	CSI 38 h	WYTEXM
Send scrolling region	CSI 38 l	WYTEXM
8-bit transmission mode on (VT220)	ESC SPACE G	S8C1T
7-bit transmission mode on (VT220)	ESC SPACE F	S7C1T
Print screen	CSI 0 i	MC
Send screen	CSI 2 i	MC
Transparent print mode off	CSI 4 i	MC
Transparent print mode on	CSI 5 i	MC
PR port receive mode off	CSI 6 i	MC
PR port receive mode on	CSI 7 i	MC
Print line	CSI ?1 i	MC
Send line	CSI ?3 i	MC
Copy print mode off	CSI ?4 i	MC
Copy print mode on	CSI ?5 i	MC
Transmit form feed after send screen operation	CSI 1	DECTTC
No form feed after send screen operation	CSI 0	DECTTC
Send character at cursor	ESC 5	WYXCH
Send answerback message	CTRL E	ENQ
Suspend transmission	CTRL S	DC3
Resume transmission	CTRL Q	DC1
<b>More Terminal Control Commands</b>		
Delay processing about 250 ms	ESC ,	WYDELAY
Display screen adjustment pattern	ESC # 8	DECALN
Sound bell, if enabled	BEL (CTRL G)	
Abort escape sequence; no character displayed <sup>5</sup>	CAN (CTRL X)	
Abort escape sequence; display reverse question mark <sup>5</sup>	SUB (CTRL Z)	
Initiate escape sequence	ESC (CTRL [)	

5. In VT52 or VT100 modes, displays checkerboard character.

Table H-1 Continued

Command	Sequence	Mnemonic
<b>Terminal Resets</b>		
Soft terminal reset	CSI ! p	DECSTR
Hard terminal reset	ESC c	RIS
Terminal mode reset	ESC ! p	WYSTR
<b>Controlling L1-L4 Status Line Labels</b>		
Suppress L1-L4 labels	CSI 0 q	DECLL
Display L1 label <sup>6</sup>	CSI 1 q	DECLL
Display L2 label <sup>6</sup>	CSI 2 q	DECLL
Display L3 label <sup>6</sup>	CSI 3 q	DECLL
Display L4 label <sup>6</sup>	CSI 4 q	DECLL
<b>Terminal Status Reports</b>		
Request product type identification (VT100 mode only)	ESC SPACE	WYID
Respond WY-99GT	99 CR	
Request primary attributes report	CSI 0 c or ESC Z	DA DECID
Respond VT100 mode	CSI ?1;2c	
Respond VT220 mode	CSI ?62;1;2;6;7;8c	
Request secondary attributes report	CSI >0 c	DA
Respond with current revision	CSI >1;20;0c	
Request terminal status report	CSI 5 n	DSR
Respond terminal functioning and ready	CSI 0 n	
Request cursor position report	CSI 6 n	DSR
Respond cursor at line <i>l</i> , column <i>c</i>	CSI <i>l</i> ; <i>c</i> R	
Request printer status report	CSI ?15 n	DSR
Respond printer ready	CSI ?10 n	
Respond printer not ready	CSI ?11 n	
Respond printer not connected	CSI ?13 n	
Request function key status report	CSI ?25 n	DSR
Respond key definitions not locked	CSI ?20 n	
Respond key definitions locked	CSI ?21 n	

6. These commands may be combined in one string by separating the numeric parameters with semicolons (;).



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## FCC Notice

**WARNING:** This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operating in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Only devices certified to comply with the limits for a Class A computing device may be attached to this equipment. Operation with noncertified device(s) is likely to result in interference to radio and TV reception.

This equipment is intended for commercial use only and is not suited for operation in Class B environments.

The use of shielded I/O cables is required when connecting this equipment to any and all optional peripheral or host devices. Failure to do so may violate FCC rules.

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